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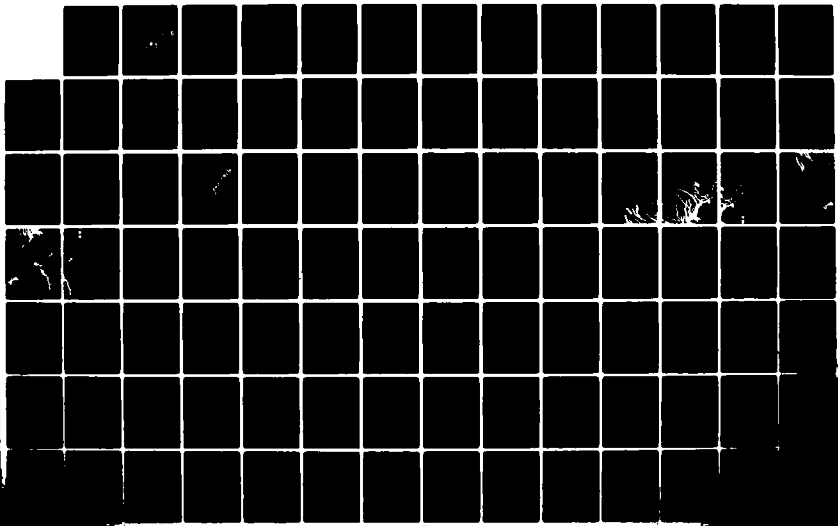

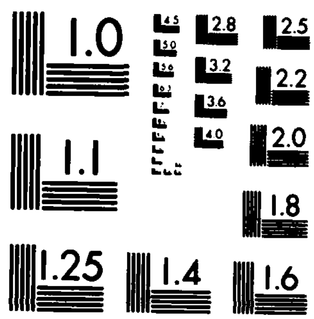

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AN ASSESSMENT OF CULTURAL RESOURCES
IN COCHITI RESERVOIR

by

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with contributions by

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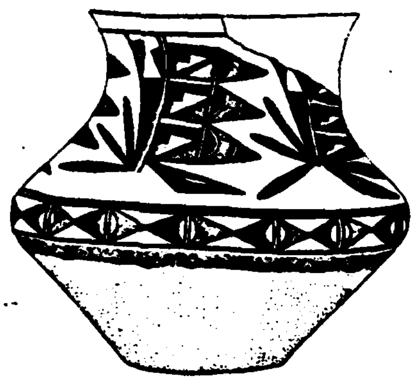

Submitted to

National Park Service
Southwest Division

Department of Interior Contract No. CX700050323
(UNM Proposal No. 101-82)
University of New Mexico
Office of Contract Archeology

November 1975

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The objective of this report was to conduct an assessment of the cutlural resources located within the boundaries of the permanent and maximum flood pool of the reservoir.

17. Document Analysis a. Descriptors

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AN ASSESSMENT OF CULTURAL RESOURCES
IN COCHITI RESERVOIR

by

Jan V. Biella
and
Richard Chapman

Submitted to

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November 4, 1975

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I. Background and Objectives of Study

A. Introduction

The Office of Contract Archeology, University of New Mexico, Albuquerque, with the cooperation of personnel from the Cultural Resource Management Division, New Mexico State University, Las Cruces, conducted an assessment of the cultural resources located within the boundaries of the permanent and maximum flood pools of Cochiti Reservoir and completed an intensive survey of the permanent pool of the reservoir. This research was conducted in compliance with the intent of existing federal and state legislation including the National Historic Preservation Act of 1966 (80 Stat. 915), National Environmental Policy Act of 1969 (91 Stat. 852) and Executive Order 11593 (36 F. R. 8921). The focus of both the assessment and the intensive survey was to document, assess and evaluate the significance of the cultural resources affected by Cochiti Reservoir. Funding for this research was made available through a contract with the National Park Service, Southwest Division, Santa Fe, under U. S. Department of Interior Contract No. CX 700050323, University of New Mexico Proposal No. 101-82.

B. Location and Extent of Project Area

Cochiti Dam and Reservoir and attendant facilities are located in north-central New Mexico in parts of Sandoval, Santa Fe and Los Alamos Counties. Easements for the project were obtained by the U. S. Army Corps of Engineers from Pueblo de Cochiti (4069 acres; 1647.4 ha), U. S. Forest Service (8236 acres; 3334.4 ha), Atomic Energy Commission (345 acres; 139.7 ha), National Park Service (361 acres; 146.2 ha), University of New Mexico (540 acres; 218.6 ha), and private individuals (139 acres;

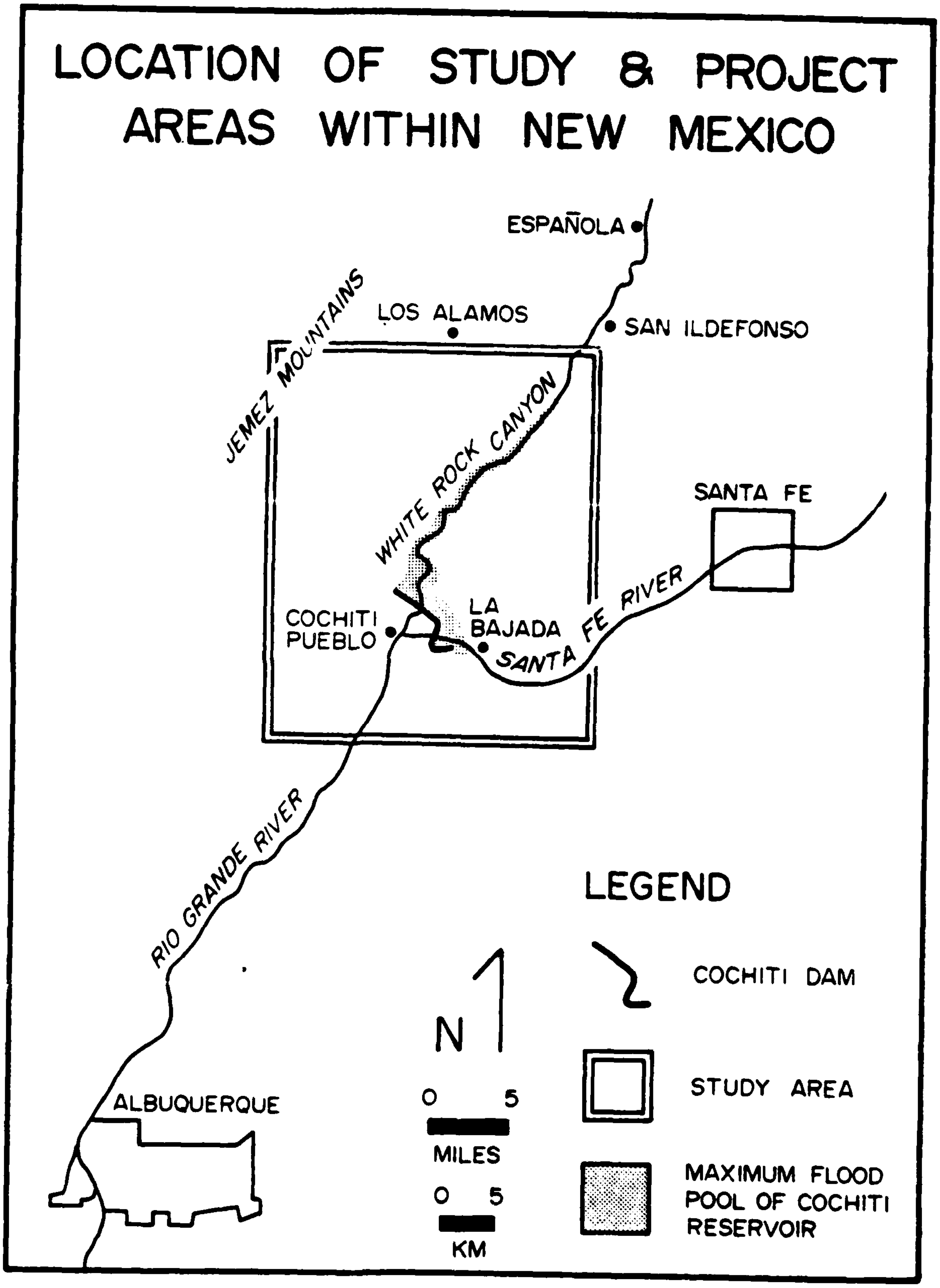
56.3 ha) (E.I.S. 1974: I-4). The project area for this study, however, will only concern the 9060 acres (3668 ha) that will be directly impacted by Cochiti Reservoir.

Cochiti Reservoir follows the Rio Grande and lies largely in White Rock Canyon although it extends southward across the Santa Fe River (see Fig. I.1). Within Cochiti Reservoir two distinct project areas may be defined: the permanent pool or reservoir itself and the maximum flood pool or projected flood control area.

1. Permanent Pool The permanent pool lies almost completely in White Rock Canyon and follows the 5322 ft (1622.6 m) contour upstream from Cochiti Dam. The main portion of the permanent pool is approximately 1.5 miles (2.4 km) long and 0.5 miles (0.81 km) wide. The pool extends to the mouth of Alamo Canyon nearly 8 miles (12.91 km) above the dam. The permanent pool will encompass approximately 1240 surface acres (502 ha) with a shoreline of 21 miles (33.9 km). The cultural resources directly impacted by the permanent pool are estimated to be flooded with silt deposited for the duration of the dam and project, in excess of 100 years (*ibid* VI-1).

2. Maximum Flood Pool One of the major intents of Cochiti Dam is to arrest the damaging floodflows downstream in the Middle Rio Grande and thus the largest number of cultural resources endangered by the reservoir are those located within the projected flood limits. At maximum extent the flood control pool would have a surface area of 9060 acres (3668 ha) and would follow the 5460.5 ft (1664.1 m) contour. This maximum pool would extend from the Santa Fe River north into White Rock Canyon approximately 20 miles (32.3 km) above the dam. The shoreline would extend nearly 94 miles (151.6 km) (*ibid* I-3).

FIGURE I.1



LOCATION OF STUDY & PROJECT AREAS WITHIN NEW MEXICO
ESPAÑOLA
LOS ALAMOS
SAN ILDEFONSO
JEMEZ MOUNTAINS
WHITE ROCK CANYON
SANTA FE
COCHITI PUEBLO
LA BAJADA
SANTA FE RIVER
RIO GRANDE RIVER
ALBUQUERQUE
LEGEND
COCHITI DAM
STUDY AREA
MAXIMUM FLOOD POOL OF COCHITI RESERVOIR
N
0 5
MILES
0 5
KM

C. History of Contract Research in the Cochiti Reservoir Area

The Office of Contract Archeology is the second institution to be involved in contract research in connection with construction activities in the vicinity of Cochiti Reservoir. Monies sponsored by the U. S. Army Corps of Engineers and administered through the National Park Service, Southwest Division, were let to the Division of Research, Museum of New Mexico, to conduct archeological work prior to the construction of the dam, embankment, spillway, outlet works and conveyance channel. This research involved both survey and partial and complete excavations of sites in the construction areas and is summarized in the following reports: Lange 1968; Peckham 1966; Peckham and Wells 1967, and Snow 1971, 1972a, 1972b, 1973b, 1973c. The majority of this research was conducted intermittenly between 1962 and 1967 although analysis and report preparations continued after 1967. Also, the survey and excavation in the Cochiti Lake city area and the survey of the proposed Tetilla Peak Recreation area roadway were corducted in 1970 and 1972, respectively.

As early as 1967, however, it was recognized that the work in Cochiti Reservoir was incomplete:

> Although the Museum of New Mexico has conducted archaeological salvage excavations in the Cochiti Dam and Reservoir area under contracts with the National Park Service, not even all of this area has been surveyed to record archaeological sites (Peckham and Wells 1967:3).

By the time the Final Environmental Statement was issued in February 1974, only an estimated 3% of the sites to be affected by Cochiti Reservoir had been mitigated (Snow 1972b:1) and a comprehensive and intensive inventory of the cultural resources within the permanent and maximum pools for Cochiti Reservoir had yet to be completed.

> Because of a previous lack of adequate funding necessary for a thorough survey of the project area, this report does not present an adequate inventory. To resolve this inadequacy, a thorough survey of lands below elevation 5460.5 (flood control pool), in addition to other areas (recreation areas and roads) to be affected by project activities, is currently being initiated through the coordination of the State Historical Preservation Officer, Museum of New Mexico, National Park Service, and the U. S. Army Corps of Engineers (E.I.S.1974: II-32).

In order to correct these deficiencies, the National Park Service, Southwest Division, Santa Fe, requested that the Office of Contract Archeology prepare a proposal outlining a program for completing an inventory of the cultural resources within the permanent pool and an evaluation of the significance of those resources. Such a proposal was submitted in May 1974, and a contract was let to the University of New Mexico, Office of Contract Archeology on December 4, 1974.

The proposal outlined two basic stages of research: the first, an assessment, involved a thorough review of the anthropological and archeological literature relevant to the cultural resources in Cochiti Reservoir, both permanent and maximum pools, and a review of the site records and materials derived from previous surveys and excavation in and about the reservoir. The intent of this review was to provide a substantive basis for assessing the densities, distributions and significance of the cultural resources in the reservoir. The second stage of research outlined in the proposal was designed to obtain an inventory of the surficial cultural resources in the permanent pool of the reservoir through an intensive foot survey. With the information derived from both the survey and the assessment, the significance of the cultural resources in the permanent pool could then be assessed.

D. Implementation of the Project

Implementation of the project was under the direction of Frank J. Broilo, Principal Investigator; Jan V. Biella, Project Director and Richard Chapman, Field Supervisor.

Work began on both the assessment and intensive survey immediately, since the date for the flooding and filling of the permanent pool land area was scheduled for May 1975. Since a considerable amount of research had been conducted in the vicinity of Cochiti Reservoir (see Section IV, A and B), the initial phase of assessment was to assemble the various manuscripts and publications available and to make summaries or copies of the site files and records housed at the Museum of New Mexico. Archeologists James Enloe and John R. Stein compiled the manuscripts and files from the Museum of New Mexico in December 1974; Lisa A. Jones assembled and reorganized this information during January and February 1975; and Emily Abbink and Pat Beckett reviewed and evaluated past research in the area in January and February 1975, under the direction of Jan Biella. Because of the implementation of a subsequent contract for mitigation of the cultural resources in the permanent pool, work on the assessment was largely disrupted until May 1975 and the material was formatted and computerized at that time. The rationale for this work appears in Section II and the results appear in Sections IV and VI and Appendix A.

The survey was originally scheduled to begin in early January 1975, but inclement weather, both snow and rain, delayed the initiation of the survey until February 5, 1975. The survey was completed on March 5, 1975. Of these 29 days, 16.5 days were expended in access time and the foot survey of the permanent pool. The survey included Richard Chapman, Supervisory Archeologist, and James Enloe, John Stein and Karl Laumbach, Archeologists.

The procedures and results of this survey are summarized in Sections V, VI and appear in Appendix B.

The remainder of this report will present the documentation of the resources affected by Cochiti Reservoir and will delineate and substantiate the significance of the cultural resources in the permanent pool of Cochiti Reservoir.

II. Research Perspective

A. Objectives

The objectives of this assessment are to describe and assess the significance of archeological remains present within the Cochiti Reservoir permanent pool (below 5322'). Archeological remains represent material by-products of human behavior, and as such, do not exhibit innate qualities of significance in and of themselves. Scientific significance can be assigned to archeological remains only when they are used as data to inform about the human behavior which resulted in their deposition. Theoretical considerations underlying the approaches taken to use archeological remains within the Cochiti Reservoir permanent pool in this fashion will be discussed below.

B. Approaches

The explanatory approach taken in this analysis will focus upon isolating relationships between human cultural behavior and the environment. Previous anthropological research has indicated that human cultural behavior can profitably be viewed as adaptive in nature. It has been suggested that processes resulting in cultural change, as well as much social, technological and organizational variability exhibited among cultural systems, can be understood through reference to the interaction between human populations

and their environmental contexts (Steward 1938, 1955; White 1959; Binford 1968). Although a variety of analytical and conceptual approaches have been employed to isolate processes underlying such interaction, there exists at present no agreement among researchers as to a single body of concepts and variables which can be used to explain precisely the dynamic relationship which pertains between human behavior and the environment. Such research has, however, resulted in the definition of potentially productive realms of inquiry into the general problem of cultural-ecological process. These will be examined for their relevance in assessing the significance of cultural resources within the project area.

1. <u>Cultural Behavior and Adaptation</u>

One major result of previous anthropological inquiry into the relationship of culture and environment has been a qualified consensus that human cultural behavior can be viewed either wholly or in part as an extra-somatic means of *adaptation to the environment* (White 1959), and that the organization of cultural behavior is systemic in nature (Vayda 1961; Binford 1964; Rappaport 1969; Clarke 1968). In this sense, human cultural behavior has been viewed as a self-organizing system of behavioral components through which a human population extracts energy from the environment and circulates energy throughout individual members of the population. This kind of conceptual framework for looking at human cultural behavior essentially entails two realms of analysis by which the operation of cultural systems may be delineated. The first of these resides in defining how cultural systems can be analytically segmented into components which interact in specifiable systemic relationships. The second of these concerns delineation of how a cultural system as a whole articulates as one component of an ecosystem comprised of floral, faunal and other human

population behavior.

From an archeological perspective, the vast majority of material remains comprising the archeological record are deposited as by-products of subsistence related activities undertaken by members of the human population at different times and places across the landscape. These activities include food resource procurement, production, processing and consumption, each of which entail varying kinds of tool manufacture and/or facility construction in their implementation.

It has been suggested by Flannery (1968) that such subsistence related activities can analytically be viewed as comprising behavioral components of an adaptive system. Following this suggestion, it can further be postulated that the articulation of these components into a system of adaptive behavior is done through a set of logistical strategies involving human population movement across the landscape, transportation of food resources, storage of food resources, and culturally defined social and economic relationships which pertain between members of the human population.

For purposes of analysis, then, the components of an adaptive system can be viewed as a finite set of subsistence related activities through which a human population extracts, processes and ingests energy in the form of food resources from an environment. These behavioral components are organized into a system of behavior through logistical strategies which dictate their time and place of implementation within an environmental context.

The archeological record of an adaptive system is most highly visible as material by-products of subsistence related behavior implemented at different spatial loci (or site locations) across the landscape. Given the present state of archeological research, it is possible to isolate the

kinds of subsistence related behavior engaged in at particular site locations. Analysis of lithic debitage can result in definition of techniques of stone tool manufacture and categories of tool usage, while analysis of faunal and floral remains can result in definition of species which were being procured, processed or ingested at the site location.

A primary explanatory goal of archeological analysis, however, must be that of isolating the organization of logistical strategies which conditioned the kinds of subsistence related activities engaged in at different spatial loci. If adaptive systems of behavior are viewed as cultural responses to environmental variability, then the logistical organization of behavioral components comprising those systems must be explained through reference to the structure of variability in food and technological resources exhibited by the environment within which they operate. Such explanation entails analysis of human behavioral variability within a regional, rather than site-specific, frame of reference.

2. Regional Frames of Adaptive Behavior

In order to delineate the structure and organization of a particular adaptive system or to isolate processes of change from one system state to another through time, the operation of adaptive systems must be observed across broad portions of the landscape (Binford 1964; Flannery 1968; Clark 1968; Rappaport 1969).

This previous research suggests that two methodological considerations are necessary in operationalizing a regional approach to the study of adaptive behavior. The first of these resides in defining categories of environmental variability relevant to explanation of adaptive behavior. The second of these resides in delineating relevant "on the ground" spatial boundaries which delimit that variability. The methodological approach

taken in the Cochiti Reservoir project incorporates these considerations and is outlined below.

a. Definition of Regional Environmental Content

When the components of an adaptive system are viewed as a set subsistence related activities, the relevant environmental content of a region can be defined as two general realms of variability. These are technological resources which include all materials from which tools and facilities are manufactured by a human population; and food resources, including all species which constitute sources of ingested energy to maintain the physical viability of the human population. These two resource categories are not mutually exclusive in that some food resource species may also provide technological resources in the form of bone, antler, hide, etc., for tool and facility manufacture.

The distribution of different food resource species within a region cannot be treated as static or finite either spatially or temporally. Spatial distribution of floral food resource species is largely determined by soil types, landforms, elevational gradients and climatological cycles. Their productivity varies considerably through seasonal, yearly, and multi-year cycles. Spatial distributions and productivity of more mobile faunal food resource species exhibits similar periodicity through seasonal and yearly cycles.

This kind of temporal periodicity in productivity and spatial distribution of food resource species within a region must essentially be coped with by a human population through the operation of logistical strategies concerning human population movement, food resource transportation, food resource storage, and social relations governing labor organization and redistribution of food resources among members of the

population. The finite distribution of non-living technological resources, including materials suitable for manufacture of tools and facilities essential to the pursuit of subsistence related activities, constitutes another set of parameters which must be dealt with logistically.

It is thus clear that the articulation of a human population with an environment can be specified at two levels of adaptive behavior. The first of these is at the level of subsistence related activities resulting directly in energy extraction and ingestion through procurement, processing and consumption of food resources. Such behavior necessitates employment of an ancillary set of activities for manufacture of tools and facilities required in these subsistence related pursuits.

The second level of articulation is found in the logistical strategies through which subsistence related activities are scheduled temporally and spatially within the environment so as to cope with variability in distribution, periodicity and productivity of food resource species, and distribution of technological resources. Included in this logistical organization are social mechanisms governing the redistribution of food resources throughout individual members of the human population.

A critical methodological concern in evaluating these two levels of articulation of an adaptive system with the environment resides in the "effective" nature of environmental content dictated by the specific structure and organization of particular adaptive systems being examined. The effective food and technological resource content of a region is observably different for a foraging, non-agricultural adaptive system than it is for a sedentary agricultural or industrial nation-state adaptive system. For this reason, regions selected as units of observation for archeological analysis must be stratified into categories of food and technological

resource variability appropriate to the range of adaptive systems known or expected to have operated within the boundaries defined. A similar methodological concern must be resolved in specifying spatial boundaries of a region, and will be discussed below.

b. Definition of Regional Boundaries and the Study Area

Previous studies which have employed the regional concept as a frame of reference for understanding adaptive behavior have either explicitly or implicitly attempted to define spatial boundaries of an area of study which approximate the regional boundaries of the adaptive system or set of adaptive systems being examined. Boundaries of such study areas have usually been defined operationally through delimiting the territorial extent of culturally organized human populations based upon ethnographic or historic data (Damas 1969; Stuart 1972; Lee 1969; Steward 1938, among others). Definition of regional boundaries for purposes of archeological research have generally been *a priori* attempts to replicate such territorial boundaries for past adaptive systems through use of "natural" physiographic features such as drainage systems or basin and range structures (Willey 1953; MacNeish 1964; H.S.R. 1973).

Definition of regions for archeological study in this fashion, however, does not take into account the expectation that different systems of adaptive behavior require different territorial or regional boundaries dependent upon population size, subsistence strategy, degree of technological sophistication, among other considerations. A mountain range might thus be expected to serve as a regional boundary for a band-organized foraging adaptive system in the past but cannot necessarily be expected to serve as a regional boundary for the operation of an industrial state.

From an archeological perspective then, a specific portion of the

landscape can be expected to exhibit material evidence of the operation of several adaptive systems of human behavior, each of which was characterized by different strategies of resource utilization, and territorial size. Because of this, definition of spatially delimited study areas for purposes of archeological research should not be undertaken to replicate the presumed effective territorial or regional boundaries of any single system in the past. Study areas must rather be delineated which encompass sufficient environmental variability, and as such, are large enough in spatial extent, to potentially exhibit patterning in the structure and organization of several previous adaptive systems.

Several factors were critical in selecting boundaries for such a study area which could be employed as a unit of observation to assess the significance of archeological resources within the project area. After a review of previous literature concerning cultural resources within White Rock Canyon and its environs, it became apparent that the boundaries of the project area itself were too restricted to serve as a study area. The project area did not encompass much environmental variability characteristic of the immediate vicinity which would be expected to condition the range of subsistence related activities undertaken at different site locations within the canyon itself. Further, the boundaries of the project area were not large enough to encompass patterning in settlement necessary to understand the operation of logistical strategies through which those subsistence related activities were organized into different systems of adaptive behavior.

For these reasons a study area was defined which encompassed the range of environmental variability in the vegetative communities and landforms exhibited throughout most of the Pajarito Plateau and Cerros del Rio

formations that flanked the project are- on the west and east. Through this procedure, it was considered that enough redundancy in environmental variability had been delimited to permit isolation of patterns in the adaptive systems of past human populations inhabiting the general region.

The boundaries for this study area thus selected lie between 106°30' and 107°7'15" north latitude, and 35°37'30" and 35°52'30" east longitude, and include the following U.S.G.S. New Mexico quadrangles: Bland, N.M.; Canada, N.M.; Cochiti Dam, N.M.; Frijoles, N.M.; Montoso Peak, N.M.; Santo Domingo Pueblo, N.M.; Santo Domingo Pueblo SW, N.M.; Tetilla Peak, N.M., and White Rock, N.M. (see Fig. II.1).

USGS 1:24000 TOPOGRAPHIC MAPS COVERING COCHITI STUDY AREA

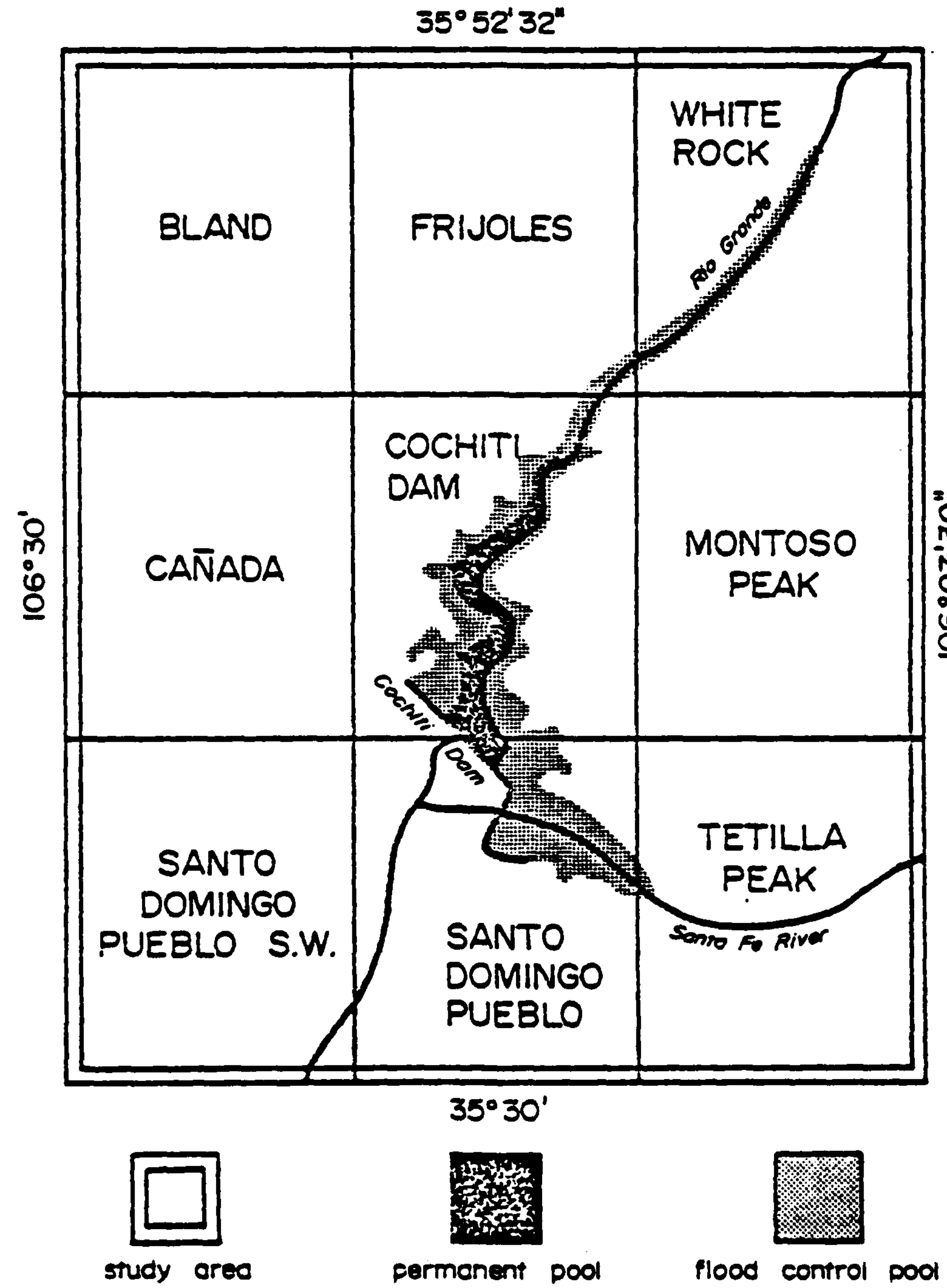


FIG. USGS Topographic Maps Covering Cochiti Study Area

III. Description of Study Area

A. Geologic Setting

1. Geographic Location and Physiographic Description

The study area is located within the Rio Grande Basin of northcentral New Mexico. It lies at the base of the eastern flank of the Jemez Mountains below the peaks of the Sierras de los Valles. The general area is characterized by hills, potreros or digitate mesas and narrow canyons which open into the gently sloping hills of the alluvial valley of the Middle Rio Grande. Prominent features of the area include the narrow erosional canyons of the Pajarito Plateau, the basalt mesas of the Cerros del Rio and the La Bajada fault scarp.

The Rio Grande is the major perennial river of the study area and it dissects the area from northeast to southwest. The Rio Grande flows through a narrow, deep canyon (White Rock) which opens above Cochiti Pueblo into the Middle Rio Grande Valley. To the east of the Rio Grande flood plain are bordering terraces which turn into the rolling plains of the Ortiz and Cerrillos Mountains.

Elevations within the study area range from 5200 ft (1585.3 m) near Cochiti Pueblo to over 7800 ft (2378 m) in the Pajarito Plateau. Precipitation ranges from 8-12 inches (20.5 - 30.8 cm) annually with the majority of the rain falling between April and October (Brakenridge n.d.). The area is thus semiarid. The climate is generally mild and the growing season extends roughly from April 23 to October 20 (Lange 1968:3).

2. Geologic Districts Within the Study Area

Because the study area is characterized by considerable geologic complexity and diversity, the area has been divided into five districts.

The boundaries for these districts, which are in part arbitrary, have been drawn along drainage basin boundaries for convenience in the later presentation of archeological information (see Fig. III.1). The information presented in this section constitutes geologic summaries largely written by A. H. Warren and are derived from Emmanuel (1950), Griggs (1964), Ross et.al. (1961) and Smith et.al. (1970), and others, as well as her own personal research in the general area during the past ten years.

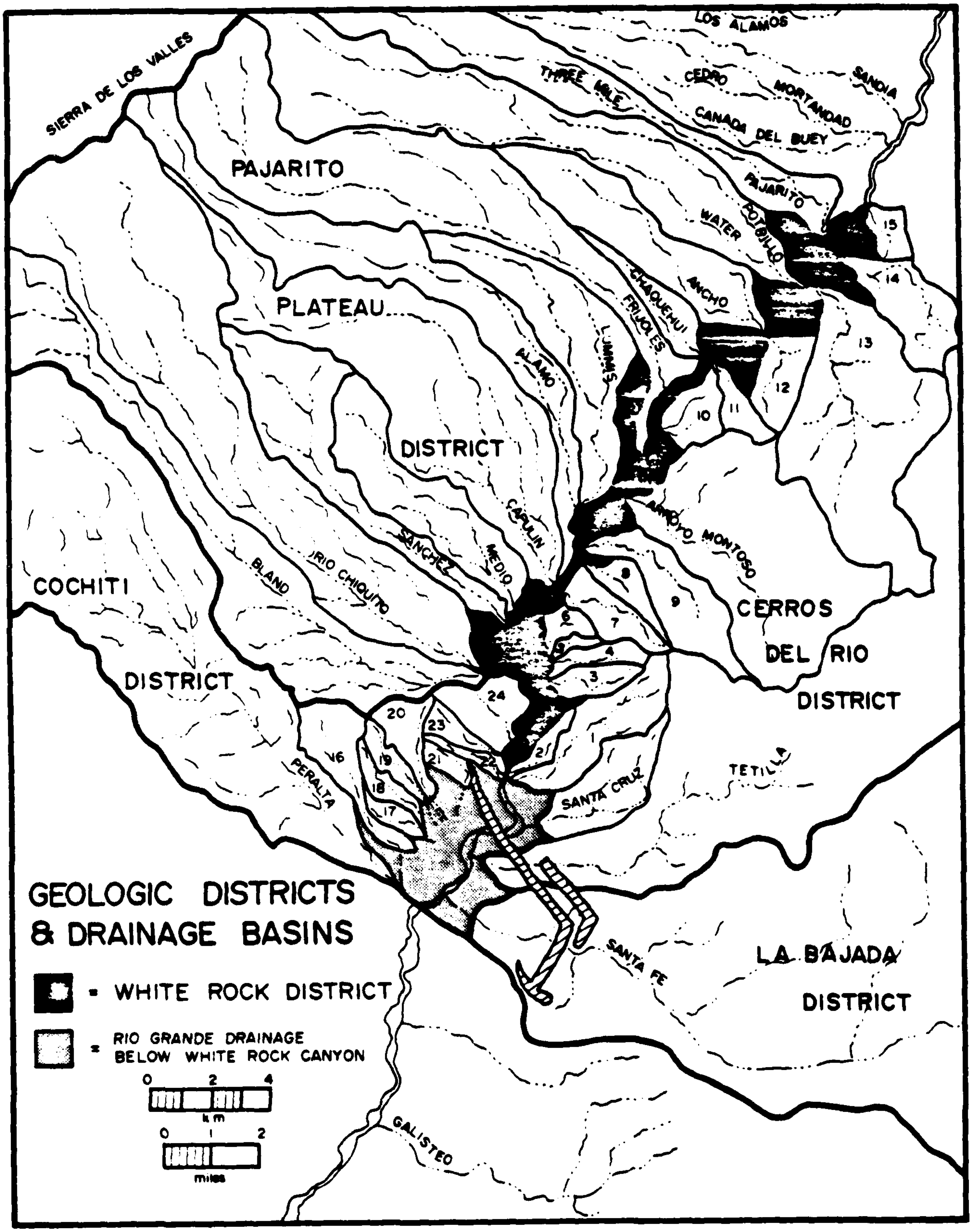
a. Geologic Description of the Pajarito District

The Pajarito Plateau lies between the Jemez Mountains on the west and the Rio Grande and White Rock Canyon on the east. The high surfaces are composed of volcanic tuff and have been deeply dissected by erosion to form high, narrow mesas or potreros and deep canyons. These canyons drain a large portion of the eastern slopes of the Jemez Caldera and form intermittent streams which flow in a southeasternly direction to the Rio Grande. Most of the canyons have only narrow, discontinuous floors along their channels, but the two southernmost canyons, Bland and Rio Chiquito, have valley floors ranging from 2000-3000 ft (610-915 m) in width.

The digitate mesas are capped with the ash flow tuffs of the Bandelier Formation of Pleistocene age. Tertiary rocks that crop out on the Pajarito include the volcanic rocks of the Puye Conglomerate and the unconsolidated axial river gravel and sand of the Totavi Lentil of the Puye. Basalt flows from the Cerros Del Rio cap the narrow mesas along the western edge of White Rock Canyon. Popcorn pumice deposits of late Pleistocene age may be found on high surfaces and on sheltered canyon slopes throughout the Pajarito.

Relief on the Pajarito is greater than in most of the other districts with mesa tops often 700-800 ft (213-244 m) above the valley floors.

FIGURE III.1


GEOLOGIC DISTRICTS
& DRAINAGE BASINS
= WHITE ROCK DISTRICT
= RIO GRANDE DRAINAGE
BELOW WHITE ROCK CANYON
0 2 4
km
0 1 2
miles
SIERRA DE LOS VALLES
LOS ALAMOS
THREE MILE
CEDRO
MORTANDAD
SANDIA
CANADA DEL BUEY
PAJARITO
POTRILLO
WATER
ANCHO
CHAQUEHUI
FRIJOLES
LUMMIS
ALAMO
PAJARITO
PLATEAU
DISTRICT
CAPULIN
MEDIO
SANCHEZ
RIO CHIQUITO
BLAND
ARROYO MONTOSO
CERROS
DEL RIO
DISTRICT
COCHITI
DISTRICT
PERALTA
SANTA CRUZ
TETILLA
SANTA FE
LA BAJADA
DISTRICT
GALISTEO
15
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Precipitation exceeds 16 inches (41 cm) per year. From south to north, the following drainages are included in the Pajarito District: Bland, Rio Chiquito, Sanchez, Medio, Capulin, Hondo, Alamo, Lummis, Rito de los Frijoles, Chaquehui, Ancho, Water, Potrillo, Pajarito, Three Mile, Canada del Buey, Mortandad, Sandia and Los Alamos.

b. Geologic Description of the Cerros del Rio District

The Cerros del Rio Plateau District encompasses the lava mesas east of White Rock Canyon and north of the Santa Fe River. The plateau extends northward from the La Bajada escarpment to Otowi Bridge near San Ildefonso. Two major periods of volcanic activity are reflected in two distinct topographic levels at approximately 6000 ft (1829 m) and 7000 ft (2134 m).

Short, but often deep, canyons drain the plateau, but unlike the Pajarito District, none have permanent or intermittent stream flows. Except for the short canyons along the borders of the plateau, the topography of the Cerros del Rio Plateau is subdued in comparison to the deep, rugged canyons and high mesas of the Pajarito Plateau. The southern portion of the plateau has been variously designated as Mesa Negra or La Bajada Mesa. The northern sections have been termed Pankey's Mesa, Chino Mesa or Sagebrush Flats. The Cerros del Rio Plateau is also called the Caja del Rio Plateau by some cartographers.

Rocks exposed on the mesa include basalt and basaltic andesite flows, basaltic cinders and scattered deposits of popcorn pumice. Rainfall averages 12 inches (31 cm) per year, with most of the precipication occurring during the summer months. The following drainages are included in the Cerros del Rio District: Canada de Cochiti (in Tetilla Canyon), Santa Cruz, Arroyo Montoso and unnamed drainages 1-15. (These unnamed

drainages were developed for a hydrological study funded under a later contract and are used here simply for convenience.)

c. Geologic Description of the La Bajada District

The La Bajada District which lies east of the Rio Grande Valley and south of White Rock Canyon is rimmed on the northeast by the Cerros del Rio basalt cliffs that mark the La Bajada fault zone. To the south is the grassy plain of the La Majada Mesa. The La Bajada District lies within the Santa Fe drainage basin. The Santa Fe River emerges from a narrow canyon east of the small village of La Bajada and flows in a slightly northeast direction as it dissects La Majada Mesa and the footslopes of the Cerros del Rio escarpment. The channel generally contains a small permanent flow of water near the village of La Bajada. This flow sinks below the surface of the sandy channel downstream toward the Rio Grande.

Bedrock exposures in the area are limited to rocks along the face of the escarpment of the Cerros del Rio. Pumice deposits of tertiary age form a cliff near the mouth of the Santa Fe River Canyon near La Bajada. The basalt of the Cerros del Rio occurs as talus clasts as well as on the escarpment. Recent dunes are located at the eastern edge of the district at the foot of the basalt cliffs. Unconsolidated channel gravel occurs along the Santa Fe River. At the western end of the district, the axial river gravel of the Rio Grande is exposed.

Relief in the district is generally low with altitudes ranging from 5400 ft (1646 m) along the river to 5500 ft (1677 m) on La Majada Mesa. Closer to the Rio Grande, where the lower mesas have been cut back by erosion, relief may be up to 200 ft (61 m). Annual precipitation is less than 12 inches (31 cm).

d. Geologic Description of the Cochiti District

The Cochiti District lies south of White Rock Canyon and is located within the Middle Rio Grande Valley at the upper end of the Santo Domingo Basin. Included in this district are the narrow foothill ridges of southern Pajarito Plateau. The river valley averages around two miles in width and is characterized by sandy fields and large cottonwood trees along the channel. The high mesas and deep canyons of the Pajarito Plateau and the Jemez Mountains rise to the northwest. The narrow, basalt rimmed White Rock Canyon is to the north and the mesas of the Cerros del Rio and La Majada are to the northeast and east.

The Rio Grande emerges from White Rock Canyon about two miles (3.2 km) north of Cochiti Pueblo. Its channel becomes braided and sandy, in contrast to the turbulent river flow in the canyon to the north. From the northwest, Peralta Canyon, a wide sandy wash enters the Rio Grande near Cochiti Pueblo. From the southeast, the Santa Fe River joins the Rio Grande.

Altitudes within the Cochiti District range from about 5200 ft (1585 m) along the river to over 5500 ft (1677 m) on the bordering mesas and ridges. Older erosional surfaces border the valley floor at altitudes 200-500 ft (61-152 m) higher. The southern ridges or foothills of the Pajarito Plateau have altitudes of over 5800 ft (1768 m).

Rocks in the area are confined to Tertiary and Quaternary axial river gravels, basaltic lava flows and pyroclastic debris, channel sand on the flood plain and aeolian deposits at higher elevations. The La Bajada Fault Zone trends northwest to southeast, paralleling the basalt cliffs of the Cerros del Rio. Numerous other north-south trending faults cut across the district but are masked by valley alluvium.

e. Geologic Description of the White Rock Canyon District

White Rock Canyon separates the Cochiti and Pajarito Districts to the west from the La Bajada and Cerros del Rio Districts to the east. It is a deep, narrow gorge about 15 miles (24.2 km) long, rimmed by basalt cliffs which rise hundreds of feet above the Rio Grande. Entering the canyon at Otowi Bridge near San Ildefonso Pueblo, the Rio Grande flows southward, emerging above Cochiti Pueblo at the northern end of the Santo Domingo Basin. The valley floor within the canyon ranges from 200-500 ft (61-152 m) wide. Narrow floodplain areas, often covered with colluvial and aeolian sand, alternate with vertical basalt cliffs throughout the canyon reaches. Landslide debris composed largely of basalt blocks, provides intermediate benches or rock terraces within the canyon.

Relief ranges from around 300 ft (91.5 m) in the lower canyon to over 1000 ft (305 m) in the upper canyon. Tributary canyons which separate the long narrow rhyolite-capped mesas of the Pajarito Plateau enter the Rio Grande from the northwest. The inner canyon is accessible only by foot trails or boats.

Rocks exposed within White Rock Canyon are of late Tertiary and Quaternary age and include the basalt flows of the Cerros del Rio, the volcanic peaks east of the canyon; welded cliff-forming tuff and pumice deposits of the Bandelier formation; quartzite conglomerate and channel sands of the ancestral Rio Grande, landslide debris; and aeolian, alluvial, colluvial sands of more recent time. Rainfall ranges from 8-12 inches (20.5-31 cm). Prevailing winds are from southeast, with southwest winds during spring. Evaporation is generally high.

B. Vegetative Communities and Life Zones

1. General Description

The majority of the study area lies in the Upper Sonoran Life Zone with portions of the Pajarito District falling within the Transition and Canadian Life Zones (Bailey 1913:42-49). The boundaries between these zones are not discrete although the Upper Sonoran Zone is confined to the lower elevations and the Transition and Canadian Zones occur with increasing elevation. Slope, exposure, soil matrix, as well as general elevation, however, condition the distribution of these zones (Robertson 1968). The diversity of vegetative communities in the study area is one of the highest in North America (Emlen 1973, E.I.S. 1974:II-25).

2. Methodology and Sources of Vegetative Information

In mid-January, Dan C. Witter conducted a reconnaissance and brief vegetative study of portions of the study area. The emphasis of this study was on the documentation of the content and structure of the major vegetative zonations, ecosystems, communities and associations in the study area, in addition to a tentative delineation of the distributions of these zones. Before the results of this study could be reported, a second contract for research in the Cochiti area was let and a detailed documentation of the boundaries between the various communities was undertaken based on interpolations from aerial photographs. Although the full documentation of the procedure will be presented in a subsequent report (Drager and Loose n.d.), the specific distribution of the communities derived from the aerial study are of sufficient importance to be presented here. Thus, the content of the biotic communities is based on Witter's study and the location of the communities is taken from the aerial stratification.

3. Location and Distribution of Vegetative Communities: Aerial Stratification of the Study Area (abstracted from Drager and Loose n.d.)

On the basis of differential patterning reflected in aerial photographs,

11 vegetative communities were identified and their boundaries determined in a study conducted by Dwight Drager and Richard Loose. The majority of the stratification was based on a single frame of False-Color Infrared film flown by the National Aeronautics and Space Administration in August 1973. This film had a scale of 1:114,000. In conjunction with the infrared film were aerial photographs from the Soil Conservation Service (New Mexico #107, 108, 131 and 132) and enlargements of two areas along the Rio Grande on file at Koogle and Pouls Engineering, Albuquerque. The boundaries that could be determined from the aerials reflected major shifts in dominant species and their corresponding communities. The following communities were defined from the aerial stratification:

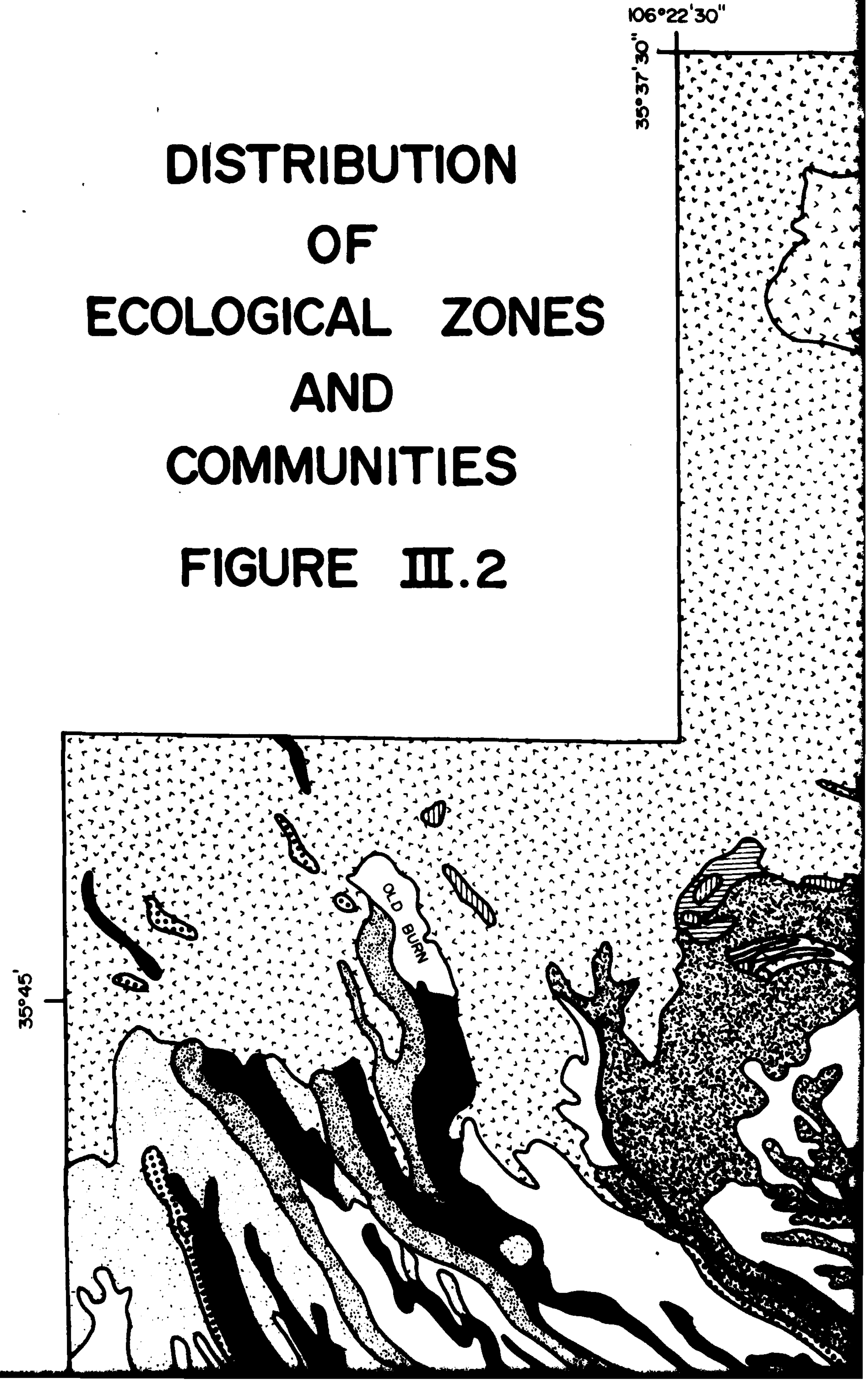
Canadian Life Zone:	Canadian Coniferous: Douglas-fir
	Canadian Deciduous: Aspen
Transition Life Zone:	Mountain Meadow
	Ponderosa Forest
Upper Sonoran Life Zone:	Riparian/Canyon Riparian
	Scrub Oak
	Prickly Pear, Cholla, Yucca
	Pinyon
	Pinyon-Juniper
	Juniper
	Juniper Grassland

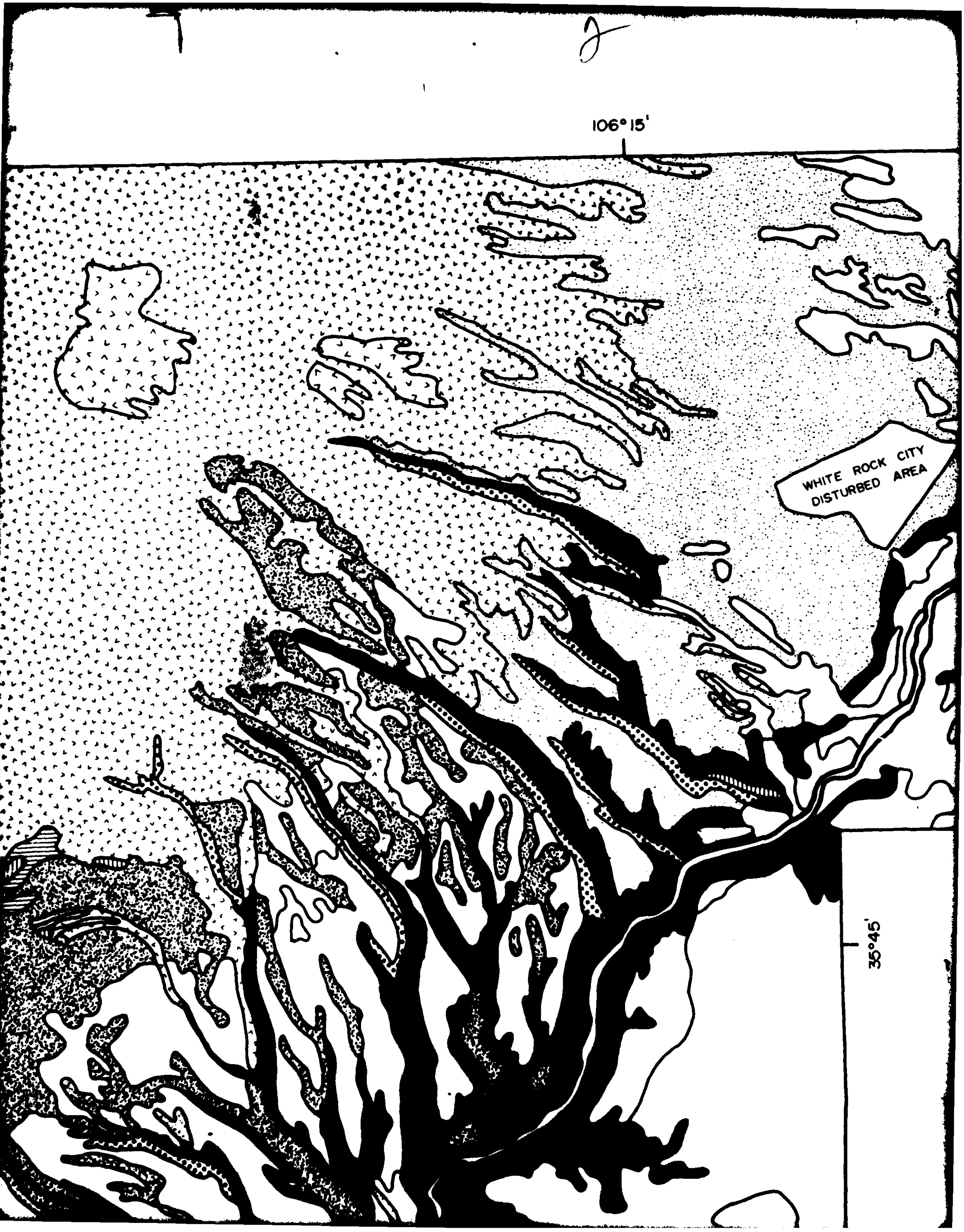
Two disturbed areas, one a trash dump outside the city of White Rock and the other modern agricultural fields around the pueblo of Cochiti were also recorded.

The distribution of these zones is represented on Fig. III.2 and is summarized in Table III.1. For a more detailed discussion of the procedures and results, see Drager and Loose n.d.

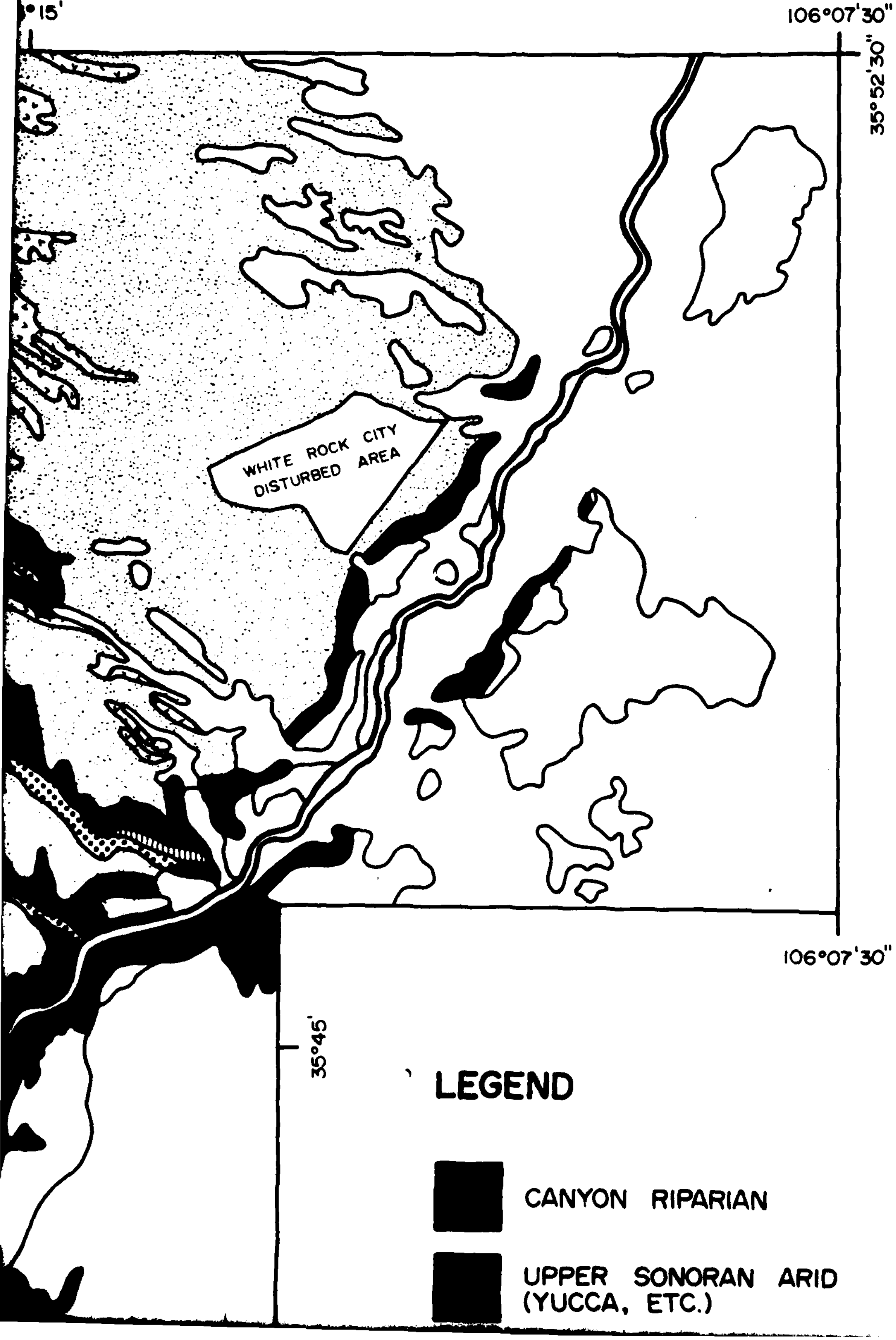
DISTRIBUTION OF ECOLOGICAL ZONES AND COMMUNITIES

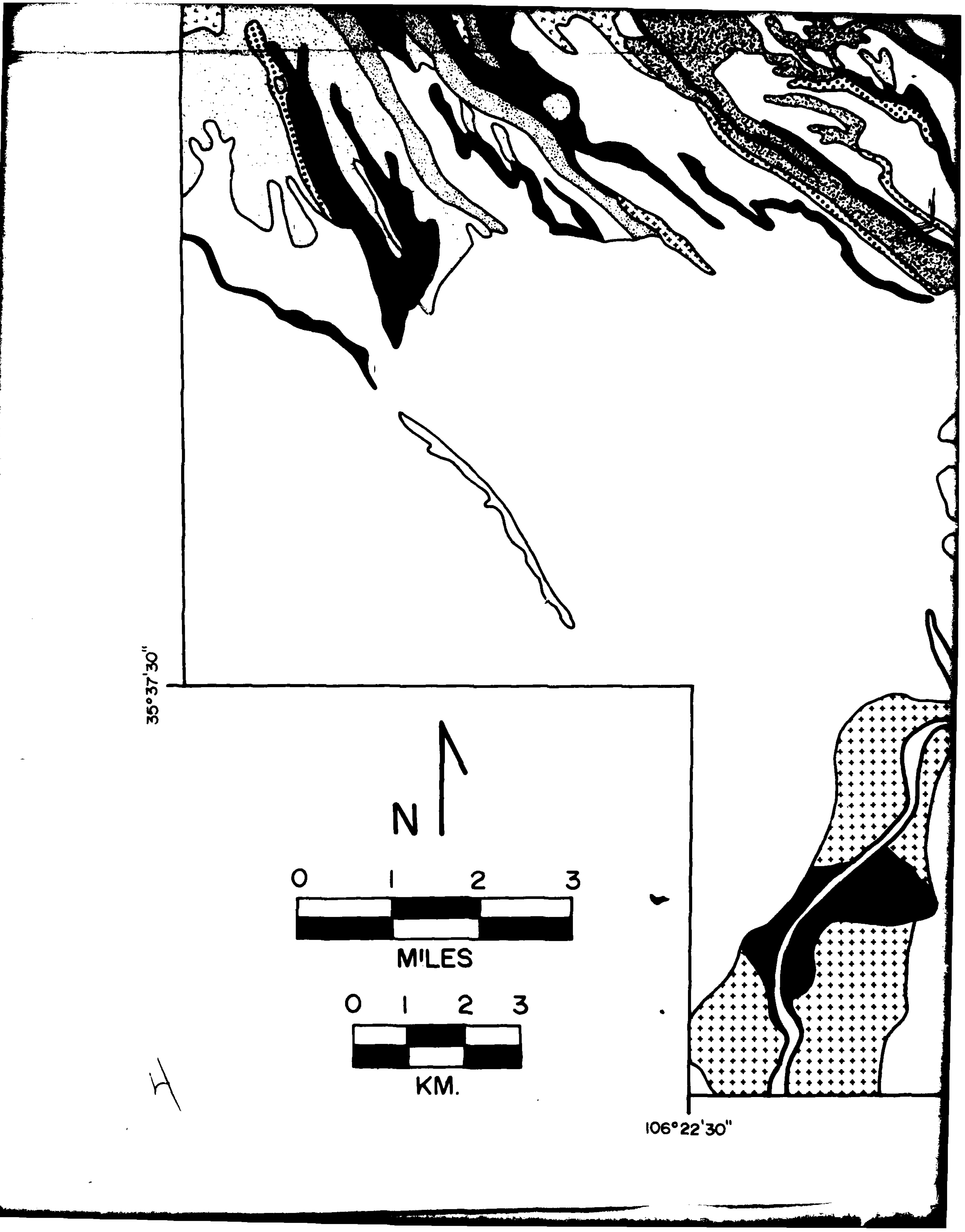
FIGURE III.2



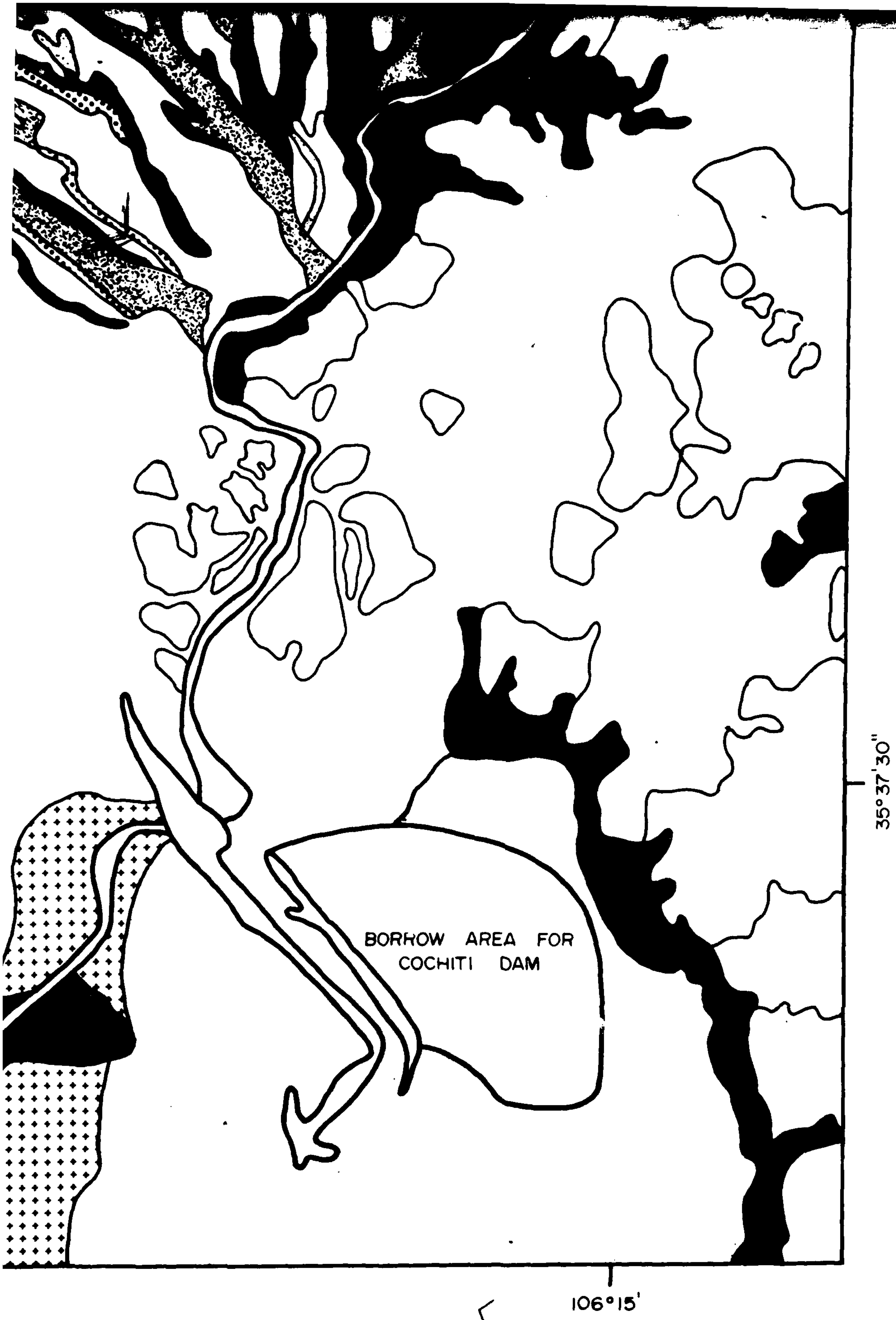

106° 15'
WHITE ROCK CITY
DISTURBED AREA
35°45'

3


°15'
106°07'30"
35°52'30"
WHITE ROCK CITY
DISTURBED AREA
106°07'30"
35°45'
LEGEND
CANYON RIPARIAN
UPPER SONORAN ARID
(YUCCA, ETC.)



35°37'30"
N
0 1 2 3
MILES
0 1 2 3
KM.
106°22'30"


BORROW AREA FOR
COCHITI DAM
35°37'30"
106°15'

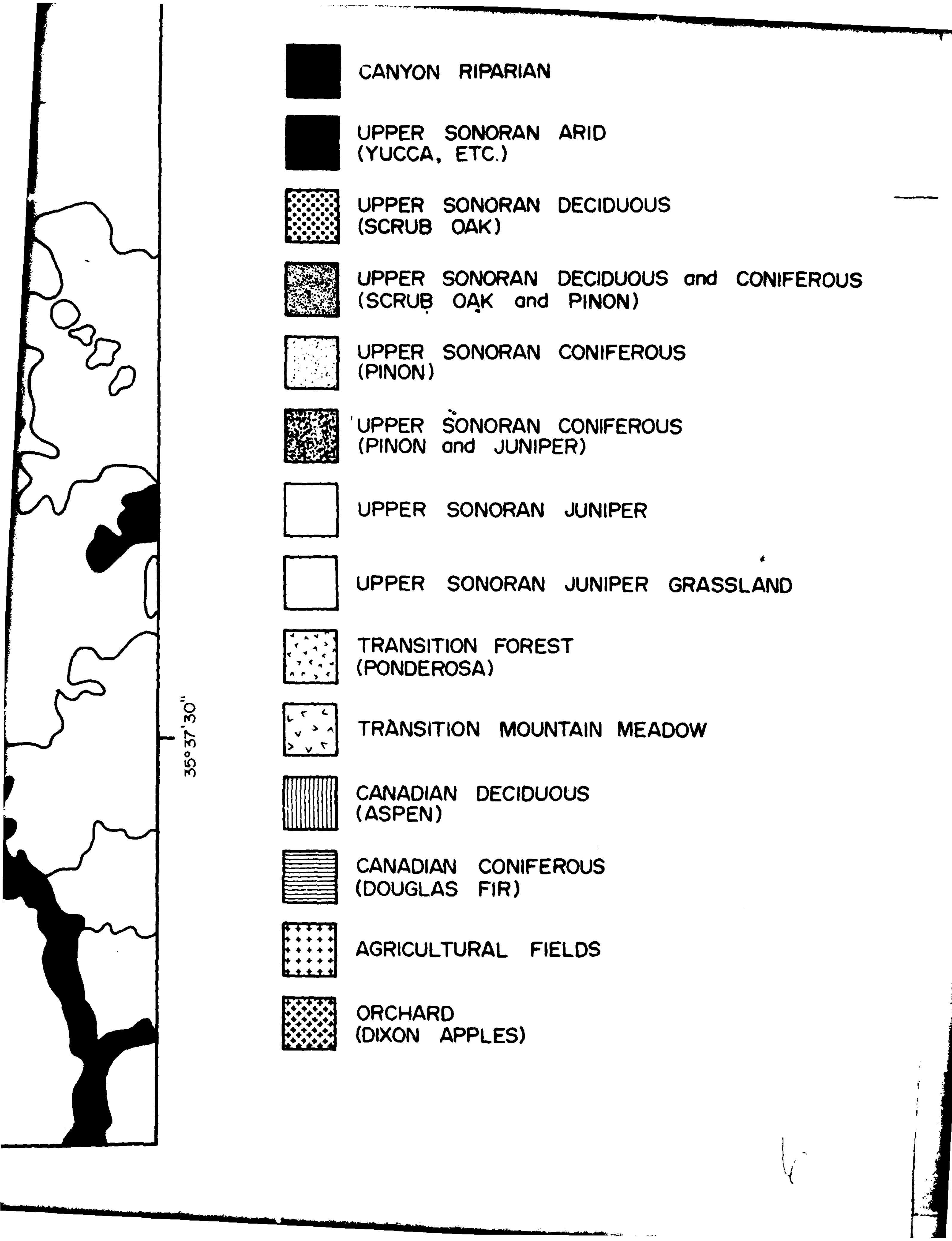

CANYON RIPARIAN
UPPER SONORAN ARID (YUCCA, ETC.)
UPPER SONORAN DECIDUOUS (SCRUB OAK)
UPPER SONORAN DECIDUOUS and CONIFEROUS (SCRUB OAK and PINON)
UPPER SONORAN CONIFEROUS (PINON)
UPPER SONORAN CONIFEROUS (PINON and JUNIPER)
UPPER SONORAN JUNIPER
UPPER SONORAN JUNIPER GRASSLAND
TRANSITION FOREST (PONDEROSA)
TRANSITION MOUNTAIN MEADOW
CANADIAN DECIDUOUS (ASPEN)
CANADIAN CONIFEROUS (DOUGLAS FIR)
AGRICULTURAL FIELDS
ORCHARD (DIXON APPLES)
35°37'30"

TABLE: III.1

SUMMARY OF ECOLOGICAL ZONES BY BASIN

(all measurements in sq.km.)

Basin	Riparian	Scruboak	Prickly pear, Cholla, Yucca	Pinon	Juniper	Juniper-Grassland	Ponderosa	Aspen	Douglas Fir	Outside Study Area	Scruboak-Pinon	Pinon-Juniper	Other	Total
Alamo	0.4694 (2.6)	0.6033 (3.4)	2.7854 (15.7)	0.0594 (.3)	1.0197 (5.8)	2.2289 (12.6)	9.1806 (51.8)					1.3747 (7.8)		17.7214
Ancho	0.8375 (4.6)	1.1064 (6.1)	1.7161 (9.5)	6.0542 (33.7)	0.3407 (1.9)	0.1561 (.9)	7.9106 (43.7)							18.1216
Arroyo Montoso			2.1325 (8.5)		21.0880 (84.1)	1.9057 (7.6)								25.1262
Bland		0.0631 (2.6)			2.0210 (85.6)	0.2824 (11.8)								2.3665
Bland above Rio Chiquito	0.0929 (.2)		1.2515 (2.5)	2.7518 (5.4)	25.6503 (50.2)		19.0890 (37.4)				2.1710 (4.3)			51.0065
Tetilla Canyon			3.2253 (9.0)		14.0988 (39.5)	18.3464 (51.4)								35.6705
Canada del Buey				5.3641 (60.7)	0.1672 (8.9)		2.4026 (27.2)						0.8983* (10.1)	8.8322
Capulin	1.8053 (3.7)	0.4410 (.9)	2.1026 (4.3)		8.8062 (18.2)	7.0726 (14.6)	17.4393 (36.0)	0.1040 (.2)	0.6294 (1.3)			9.8632 (20.4)		48.2636
Cedro				2.4186 (85.0)			0.4274 (15.0)							2.8460
Chaquehui	0.2763 (6.4)	0.3159 (7.3)	0.6455 (14.9)	2.9105 (67.5)			0.1610 (3.7)							4.3092
Los Alamos				4.6356 (31.7)	4.6864 (31.9)	4.3406 (29.6)	0.9862 (6.7)							14.6488

Table III.1—Continued

Basin	Riparian	Scruboak	Prickly pear, Cholla, Yucca	Pinon	Juniper	Juniper-Grassland	Ponderosa	Aspen	Douglas Fir	Outside Study Area	Scruboak-Pinon	Pinon-Juniper	Other	Total
Lummis	0.2948 (1.8)		2.9391 (18.1)	1.9144 (11.9)	1.7867 (11.1)	1.5847 (9.9)	5.2514 (32.8)					3.9016 (24.4)		17.6727
Medio		0.8153 (5.1)	0.8401 (5.25)	0.8686 (5.43)	8.1907 (51.22)	0.1796 (1.12)	0.1313 (0.82)	0.0111 (.069)	0.0916 (.57)			4.8623 (30.408)		15.9906
Mortendad			0.1833 (1.38)	6.9292 (52.23)	0.4584 (3.455)	1.2786 (9.639)	4.4151 (33.28)							13.2646
Pajarito			0.2242 (.9)	6.4670 (27.2)	0.2979 (1.25)	0.4101 (1.7)	15.3888 (64.78)						0.9665* (4.0)	23.7545
Peralta	1.7000 (2.87)	0.6665 (1.12)	2.8202 (4.77)	10.4274 (17.65)	40.3781 (68.38)	0.8339 (1.41)	2.2193 (3.758)							59.0454
Potrillo						1.5427 (32.6)	2.5960 (54.93)			0.5873 (12.45)				4.7260
Pueblo				1.2416 (92.01)			0.1078 (7.98)							1.3494
Rio Chiquito	1.0829 (3.0)	0.2600 (.73)	3.6652 (10.42)	1.0529 (2.99)	19.3158 (54.93)		2.7321 (7.77)				5.3788 (15.3)		0.2775** 1.3940+ (3.96)	35.1592
Rio Grande below White Rock	4.6888 (28.58)												11.7136* (71.4)	16.4024
Rio Grande-White Rock	0.1199 (.2)	0.6666 (1.1)	10.8118 (18.1)	2.6130 (4.4)	29.1847 (49.0)	15.0102 (25.2)						0.8200 (1.4)	0.3705* (0.6)	59.5967
Rito De Frijoles	0.7670 (2.72)	0.8909 (3.159)	1.6640 (5.9)	1.8793 (6.665)		0.2738 (.97)	22.4869 (79.756)					0.2327 (0.825)		28.1946
Sanchez	0.3481 (1.8)	0.4361 (2.2)	0.5204 (2.7)		4.9156 (25.3)		10.3380 (53.3)	0.1238 (0.64)			0.9181 (4.7)	1.7942 (9.24)		19.4143
Sandia				8.4162 (54.1)	1.9416 (12.48)	1.3367 (8.59)	3.8536 (24.8)							15.5481
Santa Cruz			1.4321 (17.6)		4.4720 (55.1)	2.2130 (27.26)								8.1162

Table III.1--Continued

Basin	Riparian	Scruboak	Prickly pear, Cholla, Yucca	Pinon	Juniper	Juniper-Grassland	Ponderosa	Aspen	Douglas Fir	Outside Study Area	Scruboak-Pinon	Pinon-Juniper	Other	Total
Santa Fe			3.3420 (7.4)		2.6579 (5.89)	39.0928 (86.69)								45.0927
Seguro-LaJara					47.6762 (83.3)	9.5898 (16.7)								57.2660
Three Mile				0.1809 (4.0)			3.3841 (75.02)			0.9454 (20.96)				4.5104
Water	1.3890 (4.57)	0.5229 (1.72)	0.4943 (1.62)	7.2253 (23.79)	1.8732 (6.16)	0.2798 (.92)	14.6936 (48.38)			3.8871 (12.8)				30.3652
Unnamed Drainage #1			0.0309 (.35)		7.1065 (81.25)	1.6032 (18.4)								8.7456
#2					0.6443 (39.69)	0.9788 (60.3)								1.6231
#3					1.9776 (75.3)	0.6467 (24.6)								2.6243
#4					1.7893 (88.4)	0.2353 (11.6)								2.0246
#5					0.6406 (93.8)	0.0420 (6.2)								0.6826
#6					0.8847 (60.1)	0.5885 (39.9)								1.4732
#7					3.0421 (78.96)	0.8102 (21.0)								3.8523
#8			0.1276 (5.15)		2.1920 (88.5)	0.1561 (6.3)								2.4757
#9			0.5885 (6.1)		6.5240 (11.3)	2.4669 (25.75)								9.5794
#10			1.1497 (45.15)		1.0793 (43.39)	0.3171 (12.5)								2.5461

Table III.1—Continued

Basin	Riparian	Scruboak	Prickly pear, Cholla, Yucca	Pinon	Juniper	Juniper-Grassland	Ponderosa	Aspen	Douglas Fir	Outside Study Area	Scruboak-Pinon	Pinon-Juniper	Other	Total
#11			0.0904 (10.8)		0.6381 (76.2)	0.1090 (13.0)								0.8375
#13					2.7633 (80.76)	0.6579 (19.2)								3.4212
#14			0.0416 (.65)		4.6480 (72.4)	1.7294 (26.9)								6.4190
#15			0.0743 (5.15)		0.3023 (20.98)	1.0644 (73.86)								1.4410
#17					1.7508 (100.00)									1.7508
#18					2.0272 (100.00)									2.0272
#19					1.9306 (100.00)									1.9306
#20					3.1784 (100.00)									3.1784
#21					1.7287 (100.00)									1.7287
#22					1.2577 (96.6)	0.0446 (3.4)								1.3023
#23					1.0384 (96.3)	0.0395 (3.7)								1.0779
#24					3.1078 (68.3)	1.4396 (31.7)								4.5474
NE Corner White Rock Quad			0.1561 (0.9)		13.8659 (81.1)	3.0729 (17.9)								17.0949
TOTAL	13.8719 (1.81)	6.7880 (0.89)	45.0538 (5.88)	73.4100 (9.57)	305.1447 (39.79)	123.9655 (16.17)	145.2147 (18.94)	0.2389 (.03)	0.7210 (.09)	5.4198 (.71)	8.4679 (1.10)	22.8487 (2.98)	15.6204 (2.04)	766.7653 (100.00)

*White Rock City disturbed area, ** D, +Old Burn, # C

4. <u>Content and Structure of Vegetative Zones and Communities: Botanical Study</u> (Dan C. Witter)

In mid-January, 2.5 days were spent on a botanical study of portions of the study area. One half-day was spent in general reconnaissance and two days in recording plant transects. The focus of the study was twofold:

1. to document some of the vegetative diversity in White Rock Canyon and the area of the permanent pool of the reservoir;

2. to delineate levels of vegetative structures for the general study area.

Within White Rock Canyon, two transects were walked from the mesa top, on the west side of the canyon, to the canyon bottom and the Rio Grande. Bad ice and snow conditions prevented access and, hence, foot transects on the east side of the river. Seven other transects were partially walked or estimated from a distance.

Since the vegetative study was initiated during the height of winter, the reliability of plant identifications was sharply reduced. The majority of the shrubs lacked foliage and were not identifiable. Only perennials were recorded and of these the emphasis was placed on the documentation of trees and shrubs over grasses and succulents. The categories of vegetative information recorded included:

1. life form class--tree, shrub, grass, succulent

2. relative abundance--dominant (D) (see below for definition); common (C), or generally distributed, forming about one half or one third of the ground cover; locally common (LC), same as common except that stands occur in clumps rather than being evenly distributed; few (F), less than one half or one third of the ground cover; locally few (LF), sparse clumps instead of a general scatter; rare (R), only occur occasionally, insignificant ecologically.

Other classes of information recorded included data on geology (tertiary basalt, conglomerates and quaternary alluvium); soils (texture and color) and physiographic features (slope and exposure). This information is on file at the Office of Contract Archeology, Albuquerque.

The principle of dominance was the main theoretical consideration used in delineating ecosystems and vegetative communities. The basic concept centers on the degree to which one species is able to influence both its own environment and the environment of other species. It is a measure of the ecological importance or significance of a species in relation to other organisms associated with it. The idea of dominance may also be extended to life forms or structural properties of groups of species. Dominance is a systemic property and is not measured directly but by indices or other estimators such as percentage of ground cover, biomass, stratification of canopies, etc.

Using the concept of dominance, two structural or taxonomic levels were defined: ecosystems and biotic communities. They were based on the following definitions:

Ecosystem is primarily defined as a unit of energy flow which implies an aggregation of organisms self-organized on the basis of energetic relationships. It is usually assumed to be a consistent unit structurally (forest, grassland, etc.) with a common microclimate.

Biotic Community is used here as the variability of polythetic patterning of dominant plants and associated animals and plants within the general area. Biotic communities were defined on the basis of patterning of dominant plants and regularities of associated plants. It is used here as a higher taximonic category than plant association. The following ecosystems were defined for the study area:

Jemez Mountain Slope Ecosystem (Transition Life Zone)

1. increased precipitation (Jemez climatic system)

2. cooler temperatures

3. generally greater equibility

4. altitudinal zones on the south, east and lower slopes:
   a. minimum--mesic
   b. maximum--xeric

5. biotic communities:
   a. Ponderosa Montane--steeper slopes
   b. Montane Meadow--flat slopes
   c. Douglas Fir--higher elevations (Canadian Life Zone)

Jemez Piedmont Ecosystem (Upper Sonoran Life Zone with ecotonal effects with Transition Life Zone)

1. intermediate precipitation

2. intermediate temperature

3. intermediate equibility
   a. minimum--mesic
   b. maximum--xeric

4. biotic communities:
   a. Pinon-Juniper--in ponderosa climate but xeric effects from southwest exposure and steep slopes
   b. Side Canyon Riparian--mesic effects in canyon and equibility, running water results in riparian species
   c. Mesa Juniper-Grama--xeric, low equibility because of general exposure
   d. Mesa Draw--greater shelter from winds and sun, especially on the south and west sides and bottoms, with increased mesic, equible conditions.

Rio Grande Valley Ecosystem (Upper Sonoran--Riparian Zones)

1. decreased precipitation

2. increased temperatures

3. less equibility

4. biotic communities:
   a. Open Valley--not as xeric, mainly on the west sloped or alluvial soils retaining moisture
   b. Juniper Grassland--mainly on dry, exposed mesas with gravelly or stony soils

c. Bosque—mesic because of proximity with a braided river and less shallow water table; poor equibility macroclimate but high equibility microclimatically beneath the canopy
d. Flood Plain—flat, clayey soils, periodic flooding in past; now under irrigated cultivation

White Rock Canyon Ecosystem (Upper Sonoran—Riparian with Transition elements)

1. gradient from intermediate precipitation—temperature to the cooler and more moist effects produced by the proximity to the Jemez Mountains

2. increased equibility resulting from reduced wind effects, solar warming and higher humidity

3. canyon width—depth ratio

4. biotic communities:
   a. Riparian-Juniper—more xeric; important subdominant species change depending on proximity to Jemez Mountains; exposure by height, width and angle to north of canyon walls, slope, and closeness to canyon rim or bottom
   b. Mountain Mahogany—maximally mesic resulting from vertical; also located relatively close to Jemez Mountains; effects from seeps from the consolidated conglomerate sides
   c. Deciduous Riparian—xeric conditions of exposure with increased photosynthesis period; away from Jemez Mountains but located on an alluvial bank near the river thus increasing mesic effects
   d. Stream Side—narrow channel caused by regular flooding, otherwise poor equibility, but very wet.

The content of the biotic communities listed above is summarized in Table III.2. The corresponding community defined by the aerial stratification in the previous section is listed in the same table.

C. <u>Faunal Distributions</u>

1. <u>General Description</u>

Detailed information based on intensive field studies documenting faunal distributions, densities and habitat ranges are extremely limited for the study area. General summaries may be found in Burt and Grossenheider (1964), E.I.S. (1974) and Findley (1975). Most studies have centered upon

TABLE III.2

BIOTIC COMMUNITIES

COMMUNITY	SPECIES	ABUNDANCE	AERIAL ZONE
Ponderosa-Montane Forest	Ponderosa	Dom--C	Ponderosa
	Holly Leaf Oak	LF	
	Mountain Mahogany	LF	
	Juniper	LF	
	cf.Echinocereus	R	
	Small Rabbitbrush	R	
	Prickly Pear	R	
	cf.Mountain Poa	LC	
	Gramma Grass	LC	
	Side Oats Gramma	LF	
	?Nolina	R	
	Apache Plume	R	
	Cholla	R	
	Large Rabbitbrush	LF	
	Pinyon	LF	
Montane Meadow	Gramma Grass	Dom--LF, LC	Mountain Meadow
	cf.Mountain Poa	Dom--LF, LC	
	Large Rabbitbrush	LF	
	Snakeweed	F	
	?Winterfat	LP	
Pinyon-Juniper Escarpments	Pinyon	Dom--LF	Pinyon-Juniper
	Juniper	Dom-LF	
	Holly Leaf Oak	LF	
	Mountain Mahogany	LF	
Side Canyon Riparian	Cottonwood	Dom--F	Canyon Riparian
	Juniper	Dom--F	
	Ponderosa	Dom--LF	
	Willow	LF	
	Russian Olive	R	
	Pinyon	R	
	cf. Cholla	R	
	Large Rabbitbrush	LF	
	Grasses	LC	
	?Alder	LF	
Mesa Juniper-Gramma Grass	Juniper	Dom--F	Juniper
	Gramma	Dom--C	
	cf. Mountain Poa	LF	
	Snakeweed	LF	
	Small Rabbitbrush	LF	
	Cholla	R	
	Pinyon	R	
	Side Oats Gramma	LC	

COMMUNITY	SPECIES	ABUNDANCE	AERIAL ZONE
Mesa Juniper-Mixed Grasses	Juniper	Dom—LF	Juniper Grasslr
	Gramma Grass	Dom—LC	
	Galleta Grass	Dom—LC	
	?Muhlenbergia	LF	
	Large Rabbitbrush	LF	
	Small Rabbitbrush	LF	
	Snakeweed	LF	
	Three Awn	LF	
Mesa Draws Juniper-Ponderosa	Juniper	Dom—F	Juniper
	Ponderosa	Dom—LF	
	Gramma	LC	
	Pinyon	LF	
	Large Rabbitbrush	LF	
Bosque Cottonwood	Cottonwood	Dom—C	Riparian
	Tamarisk	LF	
	Russian Olive	LF	
	Taller Grasses	LC	
Flood Plain Grasses	Under Cultivation-Pasture		Modern Fields
White Rock Canyon Riparian Juniper	Juniper	Dom—F	Juniper
	Gambles Oak	LF	
	Hollyleaf Oak	LF	
	?Mountain Myrtle	LF	
	Cholla	LF	
	Prickly Pear	R	
	Apache Plume	LF	
	Hackberry		
	Large Rabbitbrush	LF	
	Small Rabbitbrush	LF	
	Snakeweed	LF	
	Pinyon	R	
	Ash	R	
	cf. Poa	LF	
	Side Oats Gramma	LF	
	Narrow Leaf Yucca	R	
	Goose Berry	R	
	Composite Shrub	LF	
	Sagebrush	LF	
White Rock Canyon Mountain Mahogany			
	Mountain Mahogany	Dom—F	Juniper
	Juniper	LF	
	Apache Plume	LF	
	Holly Leaf Oak	LF	
	Broadleaf Yucca	R	
	Pinyon	R	
	Grape	R	
	Large Rabbitbrush	LF	
	Small Rabbitbrush	LF	

COMMUNITY	SPECIES	ABUNDANCE	AERIAL ZONE
White Rock Canyon Riparian-Deciduous Woodland	?Cottonwood ?Hackberry Deciduous Trees	Dom--LC	Scrub Oak
	Large Shrubs	LF	
	Small Shrubs	LC	
White Rock Canyon Stream Side Shrubs	Apache Plume	Dom--LF	Juniper
	Russian Olive	LF	
	Tamarisk	LF	
	Grasses	LC	
Bare Cliff Face	Small Shrubs	R	Prickly Pear, Yucca, Cholla

noting the occurrence of different species within the general life zones posited by Bailey (1913). Some have indicated differences between communities within different life zones, but this information is limited. Nonetheless, three generalizations can be made about the character of faunal resources in the study area:

a. the study area is rich in faunal diversity which parallels the geologic complexity and vegetative diversity noted earlier (E.I.S. 1974:II-25);

b. while the faunal diversity and counts of species is high, the relative number of individuals per species is low (ibid:II-26);

c. ecotonal areas, in particular, are expected to exhibit an especially high faunal diversity in that they support species from the adjacent ecozones as well as a species complement unique to the ecotone (ibid:II-25).

2. Distributions by Life Zones and Communities

The information available is not sufficient to discuss faunal distributions in terms of all of the vegetative communities identified earlier, but there is enough information to characterize the general occurrences in the life zones (Canadian, Transition and Upper Sonoran) and three "community" areas within the Upper Sonoran (pinyon-juniper, juniper grassland and White Rock Canyon). This information is summarized in Table III.3. Generic and specific nomenclature was not available in the development of this table. For those species that are listed in the literature as rare, a (R) is entered in the table; all other occurrences are assumed common and a (+) is entered. It must be emphasized that this information is interpolated from general species lists and is indicative only of potential differences in the numbers of species but is in no

TABLE III.3

FAUNAL DISTRIBUTIONS BY ZONE

	bats	shrews	squirrels	chipmunks	mice	rats	prairie dog	porcupine	cottontails	jackrabbits	general rodents	badger	fox	raccoon	coyote	bear	elk	deer	mt. lion	bobcat	wild turkey	mourning doves	songbird	quail	duck	geese	raptors	hawks	falcon	swallows
Canadian	+	+							+	+			+			+				+	+									
Transition	+	+			+	+			+		+		+	+	+	+		+	+	+	R	+	+		+					
Upper Sonoran Pinyon Juniper		+	+	+	+	+		+																						
Grassland			+		+	+	+		R			R	R		R	R							+					R		
White Rock Canyon	+													+											+	+	+	+	+	+

\+ = common
R = rare

manner suggestive of the amount of biomass available in any zone.

As can be seen from the table, the Transition Life Zone exhibits the largest number of different fauna. For the most part, the different animals occur in more than one life zone and/or community. Only in White Rock Canyon, which supports an aquatic system, do species occur in one zone and not in the others. Diversity of species appears lowest in the grassland community; it increases in the pinyon-juniper community, and higher still in the Transition Zone (E.I.S. 1974:II-26).

D. Summary of Environmental Context

The study area as a whole is characterized by high ecological diversity. The degree of diversity exhibited between geologically defined districts, however, is variable.

1. The Pajarito Plateau District with deep erosional canyons and differences in elevational gradients 5500-8000 ft (1677-2439 m), exhibits the most diversity in the study area. All three life zones that occur in the study area occur in the Pajarito Plateau. All vegetative communities that have been defined for the study area are represented on the plateau and parallel the canyon drainages, thus, crosscutting the major life zones. The faunal diversity and variability is the highest in the study area.

2. White Rock Canyon District is the next most diverse district in the study area. It is similar to the canyons of the Pajarito Plateau in that it is deeply cut. A large number of niches are created by the differences in exposure, slope and soil matrix. In terms of the study area, the canyon exhibits four of the eleven vegetative communities defined for the study area. All belong to the Upper Sonoran Life Zone. Because White Rock Canyon has permanent water (Rio Grande), certain flora and

particularly fauna (fishes and aquatic fowl) occur in this district in greater numbers than the other districts.

3. The remaining geologic districts (Cochiti, La Bajada and Cerros del Rio) are similar in diversity. Since the Rio Grande flows through the Cochiti District, however, it is probably the next most diverse district. Unlike either the Pajarito or White Rock Canyon Districts, the vegetative communities are distributed in broad expanses rather than narrow strips. The diversity of species is probably lower although the number of individuals per species is probably higher than the more diverse districts. Characteristic of this district are the broad alluvial plains of the Rio Grande and its associated floral and faunal species.

4. Both the Cerros del Rio and La Bajada districts exhibit low vegetative and faunal diversity. Only two vegetative communities, juniper and juniper grassland, have been documented for these districts. Similar to the Cochiti District, these communities are distributed in broad areal zones rather than the narrow strips of the Pajarito and White Rock Canyon Districts.

IV. Previous Anthropological Research in the Study Area

A. History and Character of Previous Research

Since the late nineteenth century, portions of the study area have been the focus of extensive and relatively continuous anthropological and archeological research. Researchers in the area have included Lummis, Bandelier, Hewett, Nelson, Mera, Goldfrank, White, Lange and Fox, among many others. General summaries of this research may be found in Dickson (1975), Ellis (1967), Flynn and Judge (1973), Hewett (1905, 1953), Kidder (1924), Lange (1959), McGregor (1965), Reed (1949), Wendorf (1954),

Wendorf and Reed (1955) and Willey (1966). The majority of these summaries are based on research conducted in the Pajarito Plateau and Bandelier National Monument areas. In more recent years, the areas of investigation have extended southward to Cochiti Pueblo and the village of La Bajada.

The first well documented anthropological reconnaissance in the study area was conducted by Aldolf Bandelier between 1880-1882 (Lange and Riley 1966; Bandelier 1892). He visited and sketched major archeological ruins in the Pajarito Plateau, including Kuapa, Shrine of the Stone Lions, Old Kotyiti, and Potrero Viejo. Other early work included studies by Starr (1899; 1900) which consisted of a census of Cochiti Pueblo, and a record of Keres migration myths recorded by Lummis in "The Wanderings of Cochiti" (Hewett 1953:4).

The first major excavations and extensive testing programs in the study area were conducted by Edgar L. Hewett at Tyuonyi, El Rito de los Frijoles, Sankewi'i and Tsirege (Hewett 1909a, 1909b). Nels C. Nelson working for the Huntington Explorations completely excavated Old Kotyiti, a pueblo revolt period site, and tested Kuapa, Pueblo Canada and Stone Lions of the Potrero de los Idolos (Wissler 1915). Copies of Nelson's field notes are on file at the Museum of New Mexico and some are reproduced in Flynn and Judge (1973).

Later in the 1930's, archeological research centered on the development of special techniques designed to establish more firmly the temporal sequences suggested by the results of the early excavations of Hewett and Nelson. Stalling's and Kubler's collections of tree-ring samples from numerous sites in the study area (Robinson 1972) and Mera's surveys and extensive ceramic analysis (Mera 1934, 1940) are examples of this type of

research. However, investigations of major ruins continued (Hendron 1940).

Concurrent with this research were a series of finite ethnographic studies. These included notes on Cochiti Pueblo by Father Noel Dumarest (Parsons 1919), an analysis of Cochiti social and ceremonial organization (Goldfrank 1927), a comparative study of Keresan medicine societies (White 1930), and a collection of Cochiti tales (Benedict 1931), among others. This was later supplemented by an extensive ethnography of the Cochiti by Charles Lange (1959).

More recent archeological research conducted in the study area was stimulated by the need to "salvage" information on sites that were being destroyed by the construction of modern facilities, in particular those sponsored by Los Alamos Scientific Laboratory (LASL) in the Pajarito Plateau and the Cochiti Dam and Reservoir Project sponsored by the U. S. Army Corps of Engineers in the southern portion of the study area. Work for LASL has been ongoing since the end of World War II and has principally been conducted by Worman, Hammock and Steen. This research is continuing. Over 200 new sites were recently added to the Museum of New Mexico files by Steen derived from a 1973-1975 survey. Archeological work in the Cochiti area has focused on construction areas for the dam, spillway, outlet works and conveyance channel, as well as work on the proposed area for the town of Cochiti Lake and various proposed recreational facilities. This work which was conducted between 1962-1967 included both survey and partial and complete excavations for the main dam area (Lange 1968; Peckham 1966; Peckham and Wells 1967; Snow 1971, 1972a, 1973b, 1973c). In 1966, a petroglyph study was undertaken by Polly Schaafsma as a part of the Cochiti Dam Salvage Project (Schaafsma 1975). A survey and limited excavations were conducted in 1970 for the area leased by California Cities

Corporation (Snow 1970) and a survey of the proposed roadway for the Tetilla Peak Recreation area was undertaken by McNeece for the Museum of New Mexico in 1972-1973 (Snow 1973a).

Other work in the study area has included the excavation of Rainbow House in Bandelier National Monument (Caywood 1966). In the Canada de Cochiti Grant, a series of surveys and limited testing were begun by Charles Lange in 1957, in which sample collections were made from sites (Lange 1958, 1961). This work was discontinued at the request of the owner of the grant. After the University of New Mexico acquired the grant, Lange agreed to conduct additional survey and testing in the grant. Consequently, under his direction, several graduate students from Southern Illinois University surveyed portions of the grant in 1969-1970 (Frisbie, Moore and Spielbauer 1970). One student, Bruce Moore, will use some of the information recorded during these surveys as a subject of a dissertation (Flynn and Judge 1973). In 1973, an assessment of the grant was conducted by personnel from the University of New Mexico. This assessment entailed an intensive foot survey of portions of the grant. Diagnostic collections were made from the 102 new sites which were recorded (Flynn and Judge 1973). These samples are on file at the Office of Contract Archeology.

Most of this research has centered on defining the cultural sequences and cultural trait inventories for the general area (Hewett 1953; Wissler 1915; Kidder 1924) or defining the boundaries of the cultural areas represented in the northern Rio Grande (Mera 1934, 1940; Hewett 1953). Other researchers have focused on an examination of the relationship between the prehistory of the Rio Grande and the Four Corners area, in particular the possible migrations of the Chacoan and Mesa Verdian peoples in light of the linguistic distribution of the modern pueblos (Ellis 1967; Reed 1949;

Wendorf 1954; Fox 1967). With the exception of Dixon's study (1975), no questions of a processual nature have been formally addressed to explain the character and distribution of sites in the study area.

Taken as a whole, the previous research does not constitute a reliable sample of the cultural resources in the study area. Some areas, such as the Pajarito Plateau and the Canada de Cochiti Grant, have been the focus of more intensive research than other areas. Also, biases in the character of the previous research have been introduced. For example, the focus of most of the previous research has been on the documentation of Anasazi Period sites, in particular, the large, spectacular ruins. This bias has been reduced in recent years, but most PaleoIndian and Archaic Period sites are still poorly represented. Early Historic Period sites of the 17th and 18th centuries have been investigated (Bandelier 1892; Wissler 1915; Wendorf 1954), but the more modern historic sites have generally been ignored.

Biases have also been introduced through the generally unsystematic manner in which sites have been located. Systematic, intensive field survey techniques which result not only in documentation of site locations, but also in the specification of land areas where sites do not occur have not been generally employed by archeologists until relatively recently. Within the study area, only Snow (1970) and Flynn and Judge (1973) conducted surveys with the intent of inventorying cultural resources through intensive foot surveys. Most other surveys conducted within the study area were extensive rather than intensive, in the sense that they were not explicitly directed toward compiling an inventory of <u>all</u> observable archeological resources within specified spatial boundaries. Such extensive surveys thus do not provide the data base necessary for making statistically reliable statements about the kind, distribution and density of archeological remains

within the areas surveyed.

From previous research, both published and unpublished, 954 sites with 1208 components have been recorded in the study area. These sites have been located on 7½ minute U.S.G.S. quadrangles which are enclosed in the pocket at the end of this report. The locations for these sites were derived largely from the master files at the Museum of New Mexico. A brief summary of each site appears in Appendix A. For each site, the following categories of information, when present, were recorded: site number, U.S.G.S. quadrangle, U.T.M. coordinate, elevation, drainage basin, ecological zone and community, type of data, period, phase, dates, site description, site size, character of lithic and ceramic assemblages, other material culture and the sources of the information. The procedure for assembling this information appears in the introduction to Appendix A.

B. Description of Cultural Resources in Study Area

In view of the magnitude of the area to be reviewed and the extent of its environmental heterogenity, the cultural resources in the study area will be described by geologic district (see Section III-A). For districts which encompass a large area or which exhibit internal ecological or archeological heterogenity, major drainage basins will serve as the spatial unit of analysis. Each summary will include an evaluation of the character and extent of previous research as well as a detailed discussion of the kind and distribution of the cultural resources.

1. Pajarito Plateau District

Of the five geologic districts, the Pajarito Plateau is the largest and has been the focus of the majority of the previous research. Over 710 archeological sites are known for the area. It also encompasses the most geological, ecological and archeological complexity of the five

districts. Of eleven biotic communities defined for the study area, all occur in the Pajarito District and crosscut at right angles to the Upper Sonoran, Transition and Canadian Life Zones, resulting in the highest ecological diversity in the study area. Eighteen major drainages dissect the plateau into generally narrow, steep canyons. The nature of the archeological research in this district fluctuates between drainages enough that each major drainage system will be discussed separately.

a. Bland

Bland is the most southernly drainage basin within the Pajarito. As Bland approaches the Rio Grande, its valley widens. Only in its upper reaches is Bland physiographically similar to the other narrow canyons of the Pajarito. Bland is one of the larger drainage systems within both the Pajarito Plateau and the study area. It encompasses 5337.3 ha. Bland lies entirely within the Upper Sonoran Life Zone. Seven vegetative communities are represented. Of these, the juniper community is the most extensive (52%).

Previous research in Bland Canyon has largely been conducted by Lange (1957-1960) for Southern Illinois University (SIU) which involved an extensive survey and limited testing (Lange 1958, 1961); an extensive survey by Moore and Spielbauer in 1969-1970 also for SIU (Frisbie, Moore and Spielbauer 1970); an intensive survey by Snow (1970) for the Museum of New Mexico (Snow 1970); and an intensive foot survey by Flynn (1973) for the University of New Mexico (Flynn and Judge 1973). The majority of this research was conducted in the lower part of the canyon where the valley broadens within the Canada de Cochiti Grant (Lange; Moore and Spielbauer; Flynn) and the northern section of Pueblo de Cochiti (Snow). Up canyon from that area no survey work has been conducted. Table IV.1 summarizes this information.

Seventy-nine sites have been located in Bland Canyon with 80 period components. Of these, three (3.8%) are PaleoIndian Period sites; five (6.3%) are Archaic sites; eight (10%) are Lithic Unknown sites; 57 (71.3%) are Anasazi sites; seven (8.8%) are Unknown Period sites. No Basketmaker or Historic Period sites have been located in Bland. The Lithic sites taken as a unit (PaleoIndian, Archaic and Lithic Unknown—see Section VI-B for explanation of rationale) occur in the juniper and juniper grassland communities. Only one lithic site (a Lithic Unknown) was distinguished by the presence of hearths. No other information about the character of other lithic sites or their assemblages was available. For the Anasazi Period sites no early Developmental (PI, PII) components were documented. Thirty-six PIII components (56.3%) and 28 PIV components (43.7%) were described. The PIII sites varied from 1 to 18 rooms and the PIV sites varied from 1 to 3 rooms with one 150 room PIII-PIV pueblo noted. With the exception of one Wiyo B/W site, all other PIII sites were Santa Fe Phase. For the PIV sites, 22 had Glaze A components, 10 Glaze B, and 8 Biscuit A.

b. Rio Chiquito

Rio Chiquito lies north of Bland Canyon and although somewhat smaller (3515.9 ha) shares similar physiographic characteristics with Bland. In its upper reaches, it is a narrow, steep canyon with its valley floor opening toward White Rock Canyon. Rio Chiquito intersects Bland approximately 1.6 km from the Rio Grande and lies solely within the Upper Sonoran Life Zone. Five vegetative communities are represented in the Rio Chiquito drainage.

Previous research in Rio Chiquito has been conducted by Nelson (Wissler 1915) through the complete excavation of Old Kotyiti and the

testing of several sites including Kuapa. Extensive surveys were undertaken by Lange (1957-1960) and Moore and Spielbauer (1969-1970) and an intensive survey by Flynn (1973). The area east of the Dome road in the Canada de Cochiti Grant, west of the Rio Grande has been intensively surveyed. The western part of the grant has been extensively surveyed, in part, to Horn Mesa. The remaining areas further west and north have not been surveyed. Summaries of this work may be found in the Museum of New Mexico files and in Lange (1958, 1961), Flynn and Judge (1973). One hundred and ninety-eight sites with 252 period components have been documented for the Rio Chiquito Drainage. One site (0.4%) is Archaic; eight sites (3.2%) are Lithic Unknown; one site (0.4%) is Basketmaker II; 157 (62.3%) are Anasazi; 61 (24.2%) are Historic; 24 (9.5%) are Unknown.

For the lithic sites, no information is available about the character of their assemblages or the distribution of the artifacts with respect to any features. The single Basketmaker II site is characterized by hearths with an associated scatter of debitage. No Basketmaker III components or PI components (early Developmental Period) are known for the Rio Chiquito drainage. Three PII sites have been recorded. These are small sites, with lithic and ceramic scatters and possibly a structure, suggesting seasonal or short term focalized activities.

Ninety PIII (Coalition) components have been noted for the Rio Chiquito. These range from 1-2 room sites to sites of over 50 rooms. Of the 91 PIV (Classic) sites, over twenty are small 1-2 room pueblos, while a few exhibit more rooms. These are generally sites with PIII and PIV components. Several terraces, shelters and small open sites date to the PIV component. Three large PIV sites, ranging from 150 to over 800 rooms have been recorded.

Of the 61 Historic period sites, 46 have been attributed to PV, or

historic pueblo. These include components in two of the large PIV sites. Room count variability is similar to PIII. Shelters and terraces are also noted for PV. Other historic sites include the Spanish town of Canada and the refugee PV site, Old Kotyiti, a Pueblo Revolt site. These are summarized in Table IV.2.

c. Sanchez and Medio

Sanchez and Medio Canyons have relatively small drainage basin areas, 1941.4 ha and 1599.1 ha, respectively. Both mark the beginning of the Pajarito Plateau canyons which remain narrow and steep to their confluence with the Rio Grande and White Rock Canyon. Both include the Upper Sonoran and Transition Life Zones with seven biotic communities represented in each.

Previous research in Sanchez Canyon stems from two surveys, Moore and Spielbauer (1969-1970) and Flynn (1973). Both surveyed lands only within the Canada de Cochiti Grant and together approximate an intensive survey for the portions of Sanchez Canyon in the grant. Outside the grant, no survey work has been conducted. Previous research for Medio Canyon includes the same two surveys for the portions of Medio Canyon in the grant. Survey north of the grant in Medio was conducted by Lange (1957-1960). Lange's survey covered portions of the canyon in an extensive, rather than intensive manner. His interests during this survey were in documenting and verifying the location of archeological sites noted during a topographic survey (Peckham and Wells 1967).

Twenty-seven sites have been located in Sanchez Canyon. Of these, 13 (48.1%) are Anasazi Period Sites, two (7.4%) are Historic sites, and 12 (44.4%) are Unknown. No Lithic or Basketmaker sites have been located. Of the Anasazi Period sites, one (6.9%) is PII; three (20.0%) are PIII

and 11 (73.3%) are PIV. One 100 room pueblo which spans PIII-PIV components has been recorded. The extent of the components at this site is not known. The other sites range from 1-6 rooms in extent, with the most variability found in the PIV components. Two terraces have been attributed to the PIV components. The historic sites include sheep pens and isolated walls. The undated sites include petroglyphs, rock shelters, terraces and isolated masonry rooms. This information is summarized in Table IV.3.

Twenty-two sites have been located in Medio Canyon. Of these, 14 (58.3%) are Anasazi; five (20.8%) are Historic and five (20.8%) are Unknown. No Lithic or Basketmaker sites were located in the canyon. Of the Anasazi period sites, five have PIII components and 10 have PIV components. The PIII sites range from 1-3 rooms in extent. Six of the PIV sites range from 1-3 rooms with one PIV shelter. One large site, San Miguel, dates solely to early PIV (Glaze A and B). The historic sites include two shelters and one 2-3 room site. Two multicomponent Anasazi-Historic open camp sites have also been located. The cultural resources in Medio Canyon are summarized in Table IV.4.

d. Capulin

Capulin is the largest canyon system (4826.4 ha) of the Pajarito District within the study area. All three life zones (Upper Sonoran, Transition and Canadian) are represented with nine of the eleven possible vegetative communities present. Ponderosa is the dominant community covering 36.0% of the total land area. Previous research in Capulin Canyon is extremely limited. Only nine sites have been located. With the exception of one site at the mouth of Capulin which was located by Moore and Spielbauer (1970) all other sites were located by Lange

(1957-1960). On Lange's survey surface collections were made, but no site descriptions have been filed with the Museum of New Mexico. Temporal phases were assigned to those sites based on ceramic counts made from the collections.

Of the nine sites located, six have Anasazi components and three cannot be dated. Of the Anasazi sites, four (40%) have PIII components and six (60%) have PIV components. No other information appears to be available. The temporal distribution of sites in Capulin is summarized in Table IV.5.

e. Alamo

Alamo Canyon is similar to Medio and Sanchez Canyons in size with 1772.1 ha. It encompasses two life zones, Upper Sonoran and Transition. It is a highly diverse canyon with eight vegetative communities present. The riparian zone, while limited (46.9 ha—2.6%), extends closer to White Rock Canyon and the Rio Grande than is true of most of the other Pajarito canyons. Of the 12 sites recorded in Alamo, 10 have been recently documented by the National Park Service (NPS) as part of a contract program in conjunction with the development of Cochiti Reservoir. The focus of NPS's work has been to locate and then excavate all sites lying within the maximum flood control pool (5460.5 ft contour). Survey has been conducted outside the flood pool, but the thrust of the work has been on sites at the mouth of Alamo Canyon. Since this work has been conducted only recently, the information summarized below stems from NPS survey forms filed with the Museum of New Mexico. More complete information should soon be forthcoming on the excavation results. The upper reaches of Alamo Canyon have not been surveyed.

Of the 12 sites located within Alamo Canyon, seven (43.8%) have

Anasazi components; four (25.0%) have Historic components and five (31.8%) cannot be assigned temporal affiliation. No lithic or Basketmaker sites have been located. Of the Ana[illegible]omponents, two may be considered PIII and five PIV. One 20 room PIII site has been recorded. One large PIII-PIV site, Pueblo of the Stone Lions, is noted approximately 2.5 km from the mouth of Alamo Canyon. The other sites are generally small and include a single one-room PIV site, one 4-10 room PIV site and several shelters, shrines (?) and lithic and ceramic scatters. The Historic sites include sheep pens and modern trash. Table IV. 6 summarizes the cultural resources in Alamo Canyon.

f. Lummis

Lummis is similar to Alamo Canyon in size (1767.3 ha). It encompasses both the Upper Sonoran and Transition Life Zones with seven vegetative communities present. Ponderosa is the most dominant community at 32.8% of the land area. Sixty-eight sites have been located in Lummis Canyon. With the exception of a few sites located by NPS connected with the work conducted in Alamo Canyon, all the remaining sites were located by Lange (1957-1960). As such, the only information available is on site location and temporal period for most of the sites. Of the 68 sites located, 64 (94.1%) have Anasazi components and four are unknown. Of the Anasazi components which can be dated, five components (6.8%) are PII, 56 (76.7%) exhibit PIII components and 12 (16.3%) have PIV components. Of the PIII components with descriptive information, four sites are 1-3 room pueblos, one is a 10-12 room pueblo and one PIII-PIV site is described as a small village. No other information is available. The resources in Lummis Canyon are summarized in Table IV.7.

g. Rito de los Frijoles

The Rito de los Frijoles drainage basin encompasses 2819.5 ha within the study area. The Upper Sonoran and Transition Life Zones are represented with seven vegetative communities present. The ponderosa community vastly dominates the area (79.8%). The lower 8 km of the Rito has been the most intensively investigated. In this area, the flood plain in the bottom of the canyon does not exceed 0.2 km in width. The stream is perennial. Much of the work in the area results from the extensive excavations of Tyuonyi and El Rito de los Frijoles by Hewett (1909a, 1909b, 1953). Hendron (1940) also published on El Rito de los Frijoles. Caywood (1966) published on excavations at Rainbow House. Other information stems from Lange's survey of 1957-1960. The information summarized in Appendix A and in Table IV.8 was derived largely from the Museum of New Mexico files and does not reflect the complexity or intensity of the prehistoric occupation:

> Some of the largest and most important sites in the area are not recorded in the current files of the Museum of New Mexico. This is the result of a historical accident. The Museum of New Mexico and School of American Research, under the direction of Dr. Edgar L. Hewett, conducted extensive archaeological excavations in the Pajarito Plateau region during the first third of the twentiety century. Although some excavations, and records of both are scanty or non-existant. As a matter of professional protocol the Laboratory of Anthropology, . . . carried out little or no field work in the Pajarito region. What surveys they made were scattered and not intensive (Peckham and Wells 1967).

In general, the ruins of the Rito consist of four community houses in the valley and one on the mesa rim near the southern edge of the canyon. A series of cliff houses extend for a distance of ca. 1.5 km. Thirteen talus villages have been identified and tested. The occupation of the Rito dates from PII, Kwahe'e, to late PIV (Hewett 1953:86). The largest site is Tyuonyi which may have accommodated a maximum population

of 500 individuals at one time (ibid.:97). These larger sites date predominantly late 14th century to early 16th century (Robinson 1972).

h. The Northern Canyons: Chaquehui, Ancho, Water, Potrillo, Three Mile and Cedro Canyons, Pajarito, Canada del Buey, Mortandad, Sandia and Los Alamos

The remaining canyons of the Pajarito are similar in physiographic conformation and the nature of the previous research in these areas is identical. Archeological sites have been recorded by Dr. Frederick C. V. Worman, Larry Hammock and C. Steen of the University of California, Los Alamos Scientific Laboratory (LASL). Worman's work was a follow up to a topographic study of Los Alamos County. Worman only recorded site location and dimensions in the records given to the Museum of New Mexico. Any site descriptions or collections remain in his possession. Hammock's and Steen's records which were given to the Museum are more complete. In fact, Steen resurveyed and relocated a number of Worman's sites. All these surveys were extensive rather than intensive and appear to have favored the Anasazi Period sites. In addition to survey, both Worman and Steen have excavated some sites in the area. One report (Worman 1967) summarizes three sites that were excavated on the Mesita del Buey. Other reports are forthcoming (Steen 1974).

1) Chaquehui is a small canyon system (430.9 ha) which lies in both the Upper Sonoran and Transition zones. Five communities are represented with pinyon dominating (67.5%). Only five sites have been located in the Chaquehui drainage basin. Three of these are PIII Anasazi sites and two are Unknown. Of the PIII sites with descriptive information, one is a 6-10 room pueblo and the other is a medium sized pueblo of ca. 10-30 rooms (see Table IV.9).

2) Ancho drainage basin encompasses 1812.2 ha with seven

vegetative communities distributed in both the Upper Sonoran and Transition Life Zones. The pinyon and ponderosa communities both dominate the area. Fifty-two sites have been located in Ancho Canyon. Of these, 29 have Anasazi components (20 PIII components and seven PIV components) and 23 of Unknown components. For those components with descriptive information, the PIII sites range from small pueblos of several rooms to pueblos of 12-15 rooms, to "large" pueblos. The PIV components are generally smaller. No large sites have PIV components. The size of undated components ranges from one room sites to sites in excess of 20 rooms (see Table IV.10).

3) Water Canyon encompasses 3036.5 ha. Seven vegetative communities crosscut the Upper Sonoran and Transition Life Zones which lie in this drainage basin. Of these communities, the ponderosa dominated 48.4% of the land area. Thirty-seven sites have been located in Water Canyon. Seventeen of these are Anasazi Period sites and 20 cannot be assigned to a temporal period. Of the 17 Anasazi sites, 15 exhibit PIII components. These sites range from small sites of one room to sites of 75-100 rooms. The majority of these cluster between 10-30 rooms. The Unknown Period sites range from small to large sites. Other undated sites include petroglyphs and torreon-like structures. Table IV.11 summarized this information.

4) Potrillo is another small drainage of 472.6 ha and is similar in size to Chaquehui. Five vegetative communities are represented in two life zones (Upper Sonoran and Transition). Ponderosa and juniper grassland are the dominant communities. Thirty-two sites have been located in Potrillo, of which, 14 exhibit Anasazi components. Only five components can be assigned to a phase, all of which are PIII. The remaining 18 components cannot be assigned to a temporal period. Of the sites that have descriptions, two are small sites of 1-4 rooms, two are medium sized

pueblos and one is a large pueblo. For the other Anasazi sites for which no phase could be assigned, the sites distribute in a similar fashion but in higher frequency. Three large and three medium sites fall into this class. Three additional large, four additional medium and two small sites fall within the unknown class. One of the PIII sites is characterized by Wiyo B/W and the others by Santa Fe B/W (see Table IV.12).

5) Three Mile and Cedro Canyons are small, encompassing 785.6 ha. They exhibit little vegetative diversity with only one vegetative community in each life zone being represented. Only six sites have been located in these canyons. Of these, three are Anasazi (two are PIII and one cannot be assigned to a phase) and the other three are Unknown. The PIII sites range from a small site with a single mound to a site with eight distinct mounds of four to eight rooms each. One large Anasazi site with no phase designation has been recorded. The unknown sites include one with a torreon-like structure. Refer to Table IV.13 for a summary.

6) Pajarito encloses an area of 2375.5 ha with five vegetative communities represented. Ponderosa is the dominant community (64.8%). Forty-nine sites have been located in the Pajarito Drainage. Twenty-nine have Anasazi components with one (4.8%) PII, 16 (76.2%) PIII, three (14.3%) PIV and one (4.8%) PV. Nineteen sites could not be assigned temporal affiliation. The majority of the PIII components were medium sized, ranging from 8-30 room pueblos. One 40 room PII-PIII site was recorded. How extensive either the PII or PIII components at this site were, however, cannot be estimated. Another multicomponent Anasazi site was LA 170, a 500 room PIII-PV pueblo. Other sites which belong to the Anasazi Period, for which no phase could be assigned included five medium sized pueblos and three large pueblos. Table IV.14 summarizes the temporal distribution of these sites.

7) Canada del Buey is a relatively small canyon of 883.2 ha. Three vegetative communities, dominated by pinyon (60.7%) in the Upper Sonoran and Transition Life Zones, occur in the canyon. Twenty-eight sites have been located in this canyon, three of which have been excavated and reported by Worman (1967). The temporal distribution includes one Basketmaker site, 15 Anasazi sites and 12 Unknown period sites. For the Basketmaker site, no information beyond period and site size was available. The PIII sites ranged from two 5-8 room pueblos to three 8-12 room pueblos to two pueblos of 15-20 rooms. No information on the character of the PIV site was available. No large sites were noted for this canyon (see Table IV.15).

8) Mortandad is a canyon in the Pajarito that encompasses 1326.5 ha. Five vegetative communities are represented with pinyon (52.2%) and ponderosa (33.3%) the dominant communities. Twenty sites have been located in Mortandad Canyon and of these 16 (80%) are Anasazi period sites and four (20%) are Unknown Period. One site had a component which could be assigned to the PII phase, seven others to PIII phase and one to PIV phase. With the exception of a single one room site of unknown temporal affiliation, no other small sites have been located in the canyon. The majority of the PIII components range from a 15-20 room pueblo to a PII-PIII site of 200 rooms. The PIV sites are medium sized pueblos of 25-30 rooms and 40-45 estimated rooms. PIV sites of this size are unusual for the Pajarito and the study area as a whole (see Table IV.16).

9) Sandia (1554.8 ha) is slightly larger than Mortandad Canyon. Its vegetative diversity is similar with four communities and pinyon (54.1%) and ponderosa (24.8%) dominant. Sixteen sites have been located in Sandia. Eleven of these are Anasazi Period sites; one is a Historic

Period site; four sites could not be assigned a temporal period. For the Anasazi sites that could be assigned a temporal phase, six were PIII and one PIV. Of the three large sites noted in the canyon, one dates to PIII; the other two were assigned to the Anasazi period, but no phase could be determined. The other three PIII sites ranged from 2-8 rooms in extent. No information about the size of the PIV site was available. The historic site consisted of isolated walls. Table IV.17 presented the distribution of sites within ecological communities for Sandia Canyon.

10) Los Alamos is a fairly large canyon, but only 1464.9 ha lie within the study area boundaries. Four vegetative communities are represented. Pinyon (31.7%) and juniper grassland (29.6%) are dominant. Only 15 sites are located in the part of the canyon that is within the study area. Of these, 12 are Anasazi Period sites; one is Historic Period; two sites are of Unknown period (see Table IV.18). Variation in the size of sites ranges from two large sites (one a multicomponent PIII-PIV site and the other Anasazi Period with no phase designation) to a 50 room PIV-PV site to several 10-20 room PIII sites to a PIII ceramic scatter (IV.18).

i. Summary of Pajarito District

The extent and the intensity of previous research in the Pajarito Plateau differs between canyon systems. El Rito de los Frijoles, Rio Chiquito and Bland Canyon have been the focus of the most intensive research. For the Rito, this intensity has been expressed in extensive excavations of some of the major ruins in the valley of the canyon. Although other smaller sites were noted near the Rito, little attention was afforded them. In the Rio Chiquito and Bland Canyons, little testing or excavations have been conducted, but portions of these canyons in the

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.1

SITES: N= 79
PERIOD COMPONENTS: N= 80
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 64
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Bland
AREA OF BASIN WITHIN STUDY AREA: 5337.3 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian 9.29 ha	Scrub Oak 6.31 ha	P. Pear, Cholla, Yucca 125.2 ha	Pinon 275.2 ha	Juniper 2767.1 ha	Pinon-Juniper None	Juniper Grassland 28.2 ha	Ponderosa 1908.9 ha	Mt. Meadow None	Juniper/ Juniper Grassland	Pinon/ Scrub Oak 217.1 ha		Period	Phase
PaleoIndian					3(100.0)								3 (3.8)	
Archaic					5(100.0)								5 (6.3)	
Lithic Unknown					7 (87.5)					1(12.5)			8(10.0)	
Basketmaker														
BM II														
BM III														
Anasazi				4(7.0)	52(91.2)						1(1.8)		57(71.3)	
P I														
P II														
P III				2(5.5)	34(94.4)									36(56.1)
P IV				4(14.2)	23(82.1)						1(3.5)			28(43.9)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown					7(100.0)								7 (8.8)	

* PV sites are included in both the Anasazi and Historic Periods

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.2

SITES: N= 189
PERIOD COMPONENTS: N= 252
PHASE COMPONENTS
Basketmaker: N= 1
Anasazi: N= 230
Historic: N= 7

DISTRICT: Pajarito
DRAINAGE BASIN: Rio Chiquito
AREA OF BASIN WITHIN STUDY AREA: 3515.9 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian 108.3 ha	Scrub Oak 26.0 ha	P. Pear, Cholla, Yucca 366.5 ha	Pinon 105.3 ha	Juniper 193.2 ha	Pinon-Juniper 1931.6 ha	Juniper Grassland None	Ponderosa 273.2 ha	Mt. Meadow	Juniper Scrub Oak	Juniper PP, Yucca, Cholla	Pinon Scrub Oak	Period	Phase
Paleoindian														
Archaic						1(100.0)							1 (.4)	
Lithic Unknown					7 (87.5)						1 (7.7)		8 (3.2)	
Basketmaker					1(100.0)								1 (.4)	
BM II					1(100.0)									1(100.0)
BM III														0 (0.0)
Anasazi					146 (93.0)					3(1.9)	8 (5.1)		157(62.3)	
P I														
P II					2 (66.7)						1(33.3)			3 (1.3)
P III					88 (97.7)						2(2.2)			90 (39.1)
P IV					86 (94.5)						5(5.4)			91 (39.6)
P V *					43 (93.4)					2(4.3)	1(2.1)			46 (20.0)
Historic		1(1.6)			56 (91.8)					2(3.3)			61(24.2)	
Post 1680														
17th Cen.					1(100.0)									1 (14.4)
18th Cen.					2 (66.7)						1(33.3)			3 (42.8)
19th Cen.														
20th Cen.														
Spanish					3(100.0)									3 (42.8)
Unknown					22 (91.7)						2 (8.3)		24 (9.5)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.3

SITES: N= 27
PERIOD COMPONENTS: N= 27
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 15
Historic: N= 1

DISTRICT: Pajarito
DRAINAGE BASIN: Sanchez
AREA OF BASIN WITHIN STUDY AREA: 1941.4 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian 34.8 ha	Scrub Oak 43.6 ha	P. Pear, Cholla, Yucca 52.0 ha	Pinon None	Juniper 491.6 ha	Pinon-Juniper 179.4 ha	Juniper Grassland None	Ponderosa 1035.8 ha	Mt. Meadow 12.4 ha	Juniper/ Pinon-Juniper	Juniper/ PP, Yucca, Cholla	Pinon Scrub Oak 91.8 ha	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi					2(15.4)	11 (84.6)							13(48.1)	
P I														
P II						1(100.0)								1 (6.7)
P III						3(100.0)								3 (20.0)
P IV					2(18.2)	9 (81.8)								11 (73.3)
P V a														
Historic						2(100.0)							2 (7.4)	
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.						1(100.0)								1(100.0)
Unknown				1 (8.3)	1 (8.3)	6 (50.0)				2(16.7)	2(16.7)		12(44.4)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.4

SITES: N= 22
PERIOD COMPONENTS: N= 24
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 15
Historic: N= 2

DISTRICT: Pajarito
DRAINAGE BASIN: Medio
AREA OF BASIN WITHIN STUDY AREA: 1599.1 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian None	Scrub Oak 81.5 ha	P. Pear, Cholla, Yucca 84.0 ha	Pinon 86.9 ha	Juniper 819.1 ha	Pinon-Juniper 486.2 ha	Juniper Grassland 18.0 ha	Ponderosa 13.1 ha	Mt. Meadow None	Juniper/ Pinon-Juniper Scrub Oak	Juniper/ Prickly.P Yucca Cholla	Juniper Scrub Oak P.Pear	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														0
BM III														0
Anasazi					9(64.3)					3(21.4)	2(14.3)		14(58.3)	
P I														
P II														
P III					4(80.0)					1(20.0)				5(33.3)
P IV					7(70.0)					1(10.0)	2(20.0)			10(66.7)
P V *														
Historic					2(40.0)					1(20.0)	2(40.0)		5(20.8)	
Post 1680														
17th Cen.														
18th Cen.					1(50.0)						1(50.0)			2(100.0)
19th Cen.														
20th Cen.														
Unknown					1(20.0)					1(20.0)	2(40.0)	1(20.0)	5(20.8)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.5

SITES: N= 9
PERIOD COMPONENTS: N= 9
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N=10
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Capulin
AREA OF BASIN WITHIN STUDY AREA: 4826.4 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		CANADIAN		ECOTONE	TOTALS	
	Riparian	Scrub Oak	P. Pear, Cholla, Yucca	Pinon	Juniper	Pinon-Juniper	Juniper Grassland	Ponderosa	Mt. Meadow	Aspen	Douglas Fir	Juniper Ponderosa P. Pear Yucca	Period	Phase
Paleoindian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				2(28.6)	2(28.6)							3(42.8)	7(70.0)	
P I														
P II														
P III				1(25.0)	2(50.0)							1(25.0)		4(40.0)
P IV				2(40.0)	2(40.0)							2(20.0)		6(60.0)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				2(66.7)								1(33.3)	3(30.0)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.6

SITES: N= 12
PERIOD COMPONENTS: N= 16
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 7
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Alamo
AREA OF BASIN WITHIN STUDY AREA: 1772.1 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian 46.9 ha	Scrub Oak 60.3 ha	P. Pear, Cholla, Yucca 278.5 ha	Pinon 5.9 ha	Juniper 102.0 ha	Pinon-Juniper 137.5 ha	Juniper Grassland 22.9 ha	Ponderosa 918.1 ha	Mt. Meadow None	Riparian PP, Yucca, Cholla			Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi			1(14.3)	1(14.3)						5(71.4)			7(43.8)	
P I														
P II														
P III				1(50.0)						1(50.0)				2(28.6)
P IV			1(20.0)	1(20.0)						3(60.0)				5(71.4)
P V *														
Historic			2(50.0)							2(50.0)			4(25.0)	
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown		1(20.0)	2(40.0)							2(40.0)			5(31.8)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.7

SITES: N= 68
PERIOD COMPONENTS: N= 68
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 73
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Lummis
AREA OF BASIN WITHIN STUDY AREA: 1767.3 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE		UNKNOWN	TOTALS	
	Riparian 29.5 ha	Scrub Oak None	P. Pear, Cholla, Yucca 293.9 ha	Pinon 191.4 ha	Juniper 178.7 ha	Pinon-Juniper 360.6 ha	Juniper Grassland 158.5 ha	Ponderosa 525.1 ha	Mt. Meadow None	Juniper/ Pinon-Juniper	Pinon/ Scrub Oak	Unknown	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi			2 (3.1)	27(42.2)		11(17.2)		16(25.0)		5 (7.8)	1 (1.6)	2 (3.3)	64(94.1)	
P I														
P II				4(80.0)		1(20.0)								5 (6.8)
P III			2 (3.5)	25(44.6)		7(12.5)		15(26.7)		5 (8.9)	1 (1.7)	1 (1.7)		56(76.7)
P IV				4(33.3)		2(16.6)		4(33.3)		2(16.6)				12(16.3)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				1(25.0)				1(25.0)		1(25.0)		1(25.0)	4 (5.9)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.8

SITES: N= 36
PERIOD COMPONENTS: N= 32
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 38
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Rito de los Frijoles
AREA OF BASIN WITHIN STUDY AREA: 2819.5 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE		UNKNOWN	TOTALS	
	Riparian 76.7 ha	Scrub Oak 89.1 ha	P. Pear, Cholla, Yucca 166.4 ha	Pinon 187.9 ha	Juniper None	Pinon-Juniper 23.3 ha	Juniper Grassland 27.4 ha	Ponderosa 2248.7 ha	Mt. Meadow None	Riparian Ponderosa P. Pear Pinon	Juniper, Juniper Grassland Pinon	Unknown	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi			3 (9.7)	4(12.9)				11(35.5)		3 (9.7)	8(25.8)	2 (6.3)	31(96.9)	
P I														
P II			2(50.0)	1(25.0)							1(25.0)			4(10.8)
P III			2 (7.1)	4(14.3)				11(39.3)		2 (7.2)	7(25.0)	2 (7.2)		28(75.7)
P IV			1(25.0)							1(25.0)	1(25.0)	1(25.0)		4(10.8)
P V *										1(100.0)				1(2.7)
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown										1(25.0)			1 (3.1)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.9

SITES: N= 5
PERIOD COMPONENTS: N= 5
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 3
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Chaquehui
AREA OF BASIN WITHIN STUDY AREA: 430.9 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		UNKNOWN			TOTALS	
	Riparian 27.6 ha	Scrub Oak 32.0 ha	P. Pear, Cholla, Yucca 64.6 ha	Pinon 291.1 ha	Juniper None	Pinon-Juniper None	Juniper Grassland None	Ponderosa 16.1 ha	Mt. Meadow None				Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				2(66.7)				1(33.3)					3(60.0)	
P I														
P II														
P III				2(66.7)				1(33.3)						3(100.0)
P IV														
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				1(50.0)								1(50.0)	2(40.0)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.10

SITES: N= 52
PERIOD COMPONENTS: N= 52
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 27
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Ancho
AREA OF BASIN WITHIN STUDY AREA: 1812.2 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian 83.8 ha	Scrub Oak 110.6 ha	P. Pear, Cholla, Yucca 171.6 ha	Pinon 605.4 ha	Juniper 34.1 ha	Pinon-Juniper None	Juniper Grassland 15.6 ha	Ponderosa 791.1 ha	Mt. Meadow	Pinon-Ponderosa			Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi	1 (3.4)			13(44.8)				14(48.3)		1 (3.4)			29(55.8)	
P I														
P II														
P III	1 (5.0)			8(40.0)				10(50.0)		1 (5.0)				20(74.1)
P IV				2(28.6)				5(71.4)						7(25.9)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				3(13.0)				20(87.0)					23(44.2)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.11

SITES: N= 37
PERIOD COMPONENTS: N= 37
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 15
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Water
AREA OF BASIN WITHIN STUDY AREA: 3036.5 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION				UNKNOWN	TOTALS	
	Riparian 138.9 ha	Scrub Oak 52.3 ha	P. Pear, Cholla, Yucca 49.4 ha	Pinon 722.5 ha	Juniper 187.3 ha	Pinon-Juniper None	Juniper Grassland 28.0 ha	Ponderosa 1469.4	Mt. Meadow None			Unknown 388.7 ha	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				15(88.2)				2(11.8)					17(45.9)	
P I														
P II														
P III				14(93.3)				1 (6.7)						15(100.0)
P IV														
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				11(55.0)		1 (5.0)		7(35.0)				1 (5.0)	20(54.1)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.12

SITES: N= 32
PERIOD COMPONENTS: N= 32
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 5
Historic: N= 0

DISTRICT: S. Pajarito
DRAINAGE BASIN: Potrillo
AREA OF BASIN WITHIN STUDY AREA: 472.6 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE		UNKNOWN	TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon None	Juniper None	Pinon-Juniper None	Juniper Grassland 154.3 ha	Ponderosa 259.6 ha	Mt. Meadow	Mt. Meadow/ Ponderosa		Unknown 58.7 ha	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				8 (57.1)				4(28.6)	1 (7.1)	1 (7.1)			14(43.8)	
P I														
P II														
P III				5(100.0)										5(100.0)
P IV														
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				7(38.9)				6(33.3)	4(22.2)	1 (5.6)			18(56.3)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.13

SITES: N= 6
PERIOD COMPONENTS: N= 6
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 2
Historic: N= 0

DISTRICT: S. Pajarito
DRAINAGE BASIN: Three Mile Canyon & Cedro Canyon
AREA OF BASIN WITHIN STUDY AREA: 735.6 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		UNKNOWN			TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon 259.9 ha	Juniper None	Pinon-Juniper None	Juniper Grassland None	Ponderosa 381.2 ha	Mt. Meadow None			Unknown 94.5 ha	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				2 (66.7)				1 (33.3)					3 (50.0	
P I														
P II														
P III				2(100.0)										2(100.0)
P IV														
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown								3(100.0)					3 (50.0)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.14

SITES: N= 49
PERIOD COMPONENTS: N= 49
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 21
Historic: N= 0

DISTRICT: S. Pajarito
DRAINAGE BASIN: Pajarito
AREA OF BASIN WITHIN STUDY AREA: 2375.5

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE		UNKNOWN	TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca 22.4 ha	Pinon 646.7 ha	Juniper 29.8 ha	Pinon-Juniper None	Juniper Grassland 41.0 ha	Ponderosa 1538.9 ha	Mt. Meadow None	Pinon-Ponderosa		White Rock City 96.7 ha	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				26 (89.7)						2 (6.9)		1 (3.4)	29(59.2)	
P I														
P II				1(100.0)										1 (4.8)
P III				14 (87.5)						1 (6.3)		1 (6.3)		16(76.2)
P IV				2 (66.7)								1(33.3)		3(14.3)
P V *				1(100.0)										1 (4.8)
Historic														
Post 1680												1(100.0)	1 (2.0)	
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				9 (47.4)				5 (26.3)		2(10.5)		3(15.8)	19(38.8)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.15

SITES: N= 28
PERIOD COMPONENTS: N= 28
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 11
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Canada Del Buey
AREA OF BASIN WITHIN STUDY AREA: 883.2 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE	UNKNOWN		TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon 536.4 ha	Juniper 16.7 ha	Pinon-Juniper None	Juniper Grassland None	Ponderosa 240.3 ha	Mt. Meadow None	Pinon-Ponderosa	Unknown	White Rock City 89.8 ha	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker								1(100.0)					1 (3.6)	
BM II														
BM III														
Anasazi				8 (53.5)				2 (13.3)		4 (26.7)	1 (6.7)		15(53.6)	
P I														
P II														
P III				5 (50.0)				1 (10.0)	4 (40.0)					10 (90.9)
P IV								1(100.0)						1 (9.1)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				3 (10.7)	1 (8.3)			3 (25.0)		3 (25.0)	2 (16.7)		12(42.9)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.16

SITES: N= 20
PERIOD COMPONENTS: N= 20
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 9
Historic: N= 0

DISTRICT: Pajarito
DRAINAGE BASIN: Mortandad
AREA OF BASIN WITHIN STUDY AREA: 1326.5 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE		UNKNOWN	TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca 18.3 ha	Pinon 692.9 ha	Juniper 45.8 ha	Pinon-Juniper None	Juniper Grassland 127.9 ha	Ponderosa 441.5 ha	Mt. Meadow None	Pinon-Ponderosa		Unknown	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				7 (43.8)			1 (6.3)	5 (31.3)		2 (12.5)			16 (80.0)	
P I														
P II				1(100.0)										1 (11.1)
P III				5 (71.4)			1(14.3)	1 (14.3)						7 (77.8)
P IV				1(100.0)										1 (11.1)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				1 (25.0)				2 (50.0)		1 (25.0)			4 (20.0)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.17

SITES: N= 16
PERIOD COMPONENTS: N= 16
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 7
Historic: N= 0

DISTRICT: S. Pajarito
DRAINAGE BASIN: Sandia
AREA OF BASIN WITHIN STUDY AREA: 1554.8 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon 841.6 ha	Juniper 194.2 ha	Pinon-Juniper None	Juniper Grassland 133.7 ha	Ponderosa 385.4 ha	Mt. Meadow None	Pinon-Ponderosa			Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				1 (9.1)				9 (81.8)		1 (9.1)			11 (68.8)	
P I														
P II														
P III								5 (83.3)		1 (16.7)				6 (85.7)
P IV										1(100.0)				1 (14.3)
P V *														
Historic										1(100.0)			1 (6.3)	
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown				1 (25.0)				3 (75.0)					4 (25.0)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.18

SITES: N= 13
PERIOD COMPONENTS: N= 15
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 12
Historic: N= 0

DISTRICT: S. Pajarito
DRAINAGE BASIN: Los Alamos
AREA OF BASIN WITHIN STUDY AREA:

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE		UNKNOWN	TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon 463.6 ha	Juniper 468.6 ha	Pinon-Juniper None	Juniper Grassland 434.1 ha	Ponderosa 98.6 ha	Mt. Meadow None	Pinon/Ponderosa		Unknown	Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi				8 (66.7)			1 (8.3)	1 (8.3)		1 (8.3)		1 (8.3)	12 (80.0)	
P I														0
P II				1(100.0)										1 (8.3)
P III				3 (75.0)			1 (25.0)							4 (33.3)
P IV				1 (20.0)			1 (20.0)	1 (20.0)		1 (20.0		1 (20.0)		5 (41.7)
P V *				1(100.0)						1				2 (16.7)
Historic				1(100.0)									1 (6.7)	
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.				1(100.0)										1(100.0)
Unknown										1 (50.0)		1 (50.0)	26 (13.3)	

Canada de Cochiti Grant have been intensively surveyed. All other areas in the Pajarito have been surveyed extensively in some areas, but often little information beyond the site location, site dimensions and, perhaps, cultural and temporal affiliation has been recorded. Most of this extensive research has been survey work with a few excavations.

Of 710 sites located in the Pajarito District, only 25 have lithic components. Three are potentially PaleoIndian sites; six may be Archaic sites and 16 are lithic sites to which a temporal period cannot be assigned. Lithic sites in the Pajarito District have only been located in Bland and Rio Chiquito drainage systems, and they are distributed solely within the juniper and juniper grassland communities. The distribution of the lithic sites in these southern drainages may reflect not the selection of particular community situations but the character of previous research. Much of the focus of the early researchers was on the large, structural Anasazi sites. These sites are not as ephemeral as lithic sites which may easily be missed by extensive, rather than intensive, surveys. Thus, the distribution of lithic sites only in the southern drainages that are dominated by the juniper communities may be a sampling error. Aside from an occasional comment that some sites may exhibit differential selection of materials (e.g. obsidian on some sites may approach 90% of the total assemblage, where other sites may be 75% basalt, etc.), little information is available on the characteristics and content of the lithic assemblages. Consequently, little can be suggested about the context of the lithic sites in the southern Pajarito.

Few sites of the Developmental, BMIII, PI, PII A.D. 600-1200 (Wendorf 1954), have been located in the Pajarito District. Only two Basketmaker sites are listed in this district: one in Rio Chiquito and one in Canada

del Buey. No information about the nature of these sites is available. No PI sites and only 15 PII sites have been recorded. With one exception, all of the PII components have later PIII components associated. Since none of these sites have been excavated, the extent of the PII components and occupation is not known. These sites occur occasionally throughout the drainages of the Pajarito with more in the southern canyons, in particular, Lummis Canyon. These sites range from one room sites with associated lithic and ceramic scatters, to a series of masonry shelters to 60-70 to 200 room pueblos. Although the PII site density for this region is low, such densities of early sites are consistent with the known distribution throughout the Northern Rio Grande (Wendorf 1954; Dickson 1975) and thus may not be the result of a sampling error.

In contrast to the early lithic and Developmental sites, the Coalition or PIII, A.D. 1200-1325 (Wendorf 1954) sites are numerous. Three hundred and thirty-one PIII component sites occur throughout the Pajarito District. Although more PIII sites are known for Bland and Rio Chiquito drainages, these have been the most intensively surveyed areas. From Lummis Canyon north, the PIII components outnumber all other components, frequently by a ratio of 3:1. The variability in site size is extensive. Sites range from one room to over 500 rooms in extent. The majority of these sites are medium-sized pueblos of 11-30 rooms and occur throughout the Pajarito. The larger sites occur in the more northernly drainages. The tremendous increase in number of sites (from 22 to 331) between PII to PIII suggests in-migration. Hewett (1953) felt that such an emigration occurred slowly over a period of 100 years and was not the result of a sudden influx in population. Since few sites of this phase have been excavated and since the ceramic sequence for this period does not distinguish sites into

early and late PIII components, the rate of any emigration cannot be assessed at this time.

One hundred and eighty-five Classic or PIV, A.D. 1325-1600 (Wendorf 1954) sites have been recorded in the Pajarito District. The variation in site size that was noted for PIII diminishes in PIV to a bimodal distribution: extremely small sites 1-5 rooms and large sites in excess of 50 rooms. Other categories of PIV sites include ceramic scatters, shelters, and terraces. The large sites co-occurring with the extremely small sites (field houses?) and terraces suggests an aggregation of the population into centers with associated specialized sites involving an intensification of land use (terraces) and specialized buffering sites (ceramic scatters, shelters).

2. Cerros del Rio District

The previous research in the Cerros del Rio has been sporadic and extremely limited both in areal extent and content. Only 20 archeological sites have been located in this district in contrast to the 710 sites of the Pajarito Plateau District. Those sites which have been located in the Cerros del Rio, with the exception of LA 5, a large Anasazi village, were recorded in conjunction with the various phases of Museum of New Mexico's Cochiti Dam Salvage Project. For the most part, however, this district was peripheral to the major construction areas and only small portions of the southern extent of the Cerros were surveyed. One site, LA 8720, a lithic quarry and manufacturing site, was intensively examined (Snow 1973c). The remaining sites located in the Cerros stem from surveys by Dittert, Steen and Schroeder in 1962, Schaafsma in 1966, Snow in 1970 and McNeece in 1972-1973. The 1962 and 1970 surveys covered some areal extent near the proposed borrow areas for Cochiti Dam as well as portions

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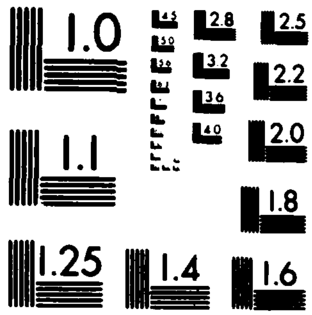

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

of mesa top across from the mouth of Bland Canyon. The other two surveys were confined to areas below the mouth of White Rock Canyon near the Tetilla Peak Recreation area.

Of the 20 sites located in this district, 10 have lithic components; 11 have Anasazi components; two have historic components; and one site cannot be assigned to a temporal period. Although these sites are few in number, they are still summarized by drainage systems in Tables IV.19, 20, 21 and 22, since the distribution between drainages is somewhat different.

Sites have only been located in six of the 18 drainages in the Cerros del Rio: Santa Cruz, Tetilla Canyon (Canada de Cochiti) and Unnamed drainages 1, 2, 3, and 6. With the exception of one large PIV site containing 160 ground floor rooms, all the sites are small lithic scatters or small masonry PIV sites of 1-3 rooms. A few petroglyphs are associated with the small structural sites. With the exception of one site, none of the lithic sites were associated with hearths. The detail on the character of the lithic assemblages is minimal. Ground stone was noted for one site; choppers were noted for another.

The frequency of sites in this district is the lowest in the study area. In part, this lower frequency may be expected as a function of the limited nature of previous archeological research. The general low vegetative diversity and low level of precipitation, however, may be conditioning the low site density. Although future research will undoubtedly locate more sites, it is expected that the general density will remain low for the Cerros del Rio District as a whole.

3. La Bajada District (Table IV.23)

La Bajada District lies solely within the Santa Fe River basin and

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.19

SITES: N= 5
PERIOD COMPONENTS: N= 5
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 0
Historic: N= 0

DISTRICT: Cerros Del Rio
DRAINAGE BASIN: Santa Cruz
AREA OF BASIN WITHIN STUDY AREA: 811.6 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION					TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca 143.1 ha	Pinon None	Juniper 447.2 ha	Pinon-Juniper None	Juniper Grassland 221.3 ha	Ponderosa None	Mt. Meadow None				Period	Phase
PaleoIndian														
Archaic					1(100.0)								1 (20.0)	
Lithic Unknown					1 (33.3)		2 (66.7)						3 (60.0)	
Basketmaker														
BM II														
BM III														
Anasazi														
P I														
P II														
P III														
P IV														
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown							1 (33.3)						1 (20.0)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.20

SITES: N= 4
PERIOD COMPONENTS: N= 4
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 3
Historic: N= 0

DISTRICT: Cerror Del Rio
DRAINAGE BASIN: Tetilla Canyon(Canada de Cochiti)
AREA OF BASIN WITHIN STUDY AREA: 3567.1 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION					TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca 322.5 ha	Pinon None	Juniper 1409.9 ha	Pinon-Juniper None	Juniper Grassland 1834.6 ha	Ponderosa None	Mt. Meadow None				Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown							1(100.0)						1 (25.0)	
Basketmaker														
BM II														
BM III														
Anasazi							3(100.0)						3 (75.0)	
P I														
P II														
P III														
P IV							3(100.0)							3(100.0)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown														

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.21

SITES: N= 4
PERIOD COMPONENTS: N= 4
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 0
Historic: N= 0

DISTRICT: Cerros Del Rio
DRAINAGE BASIN: Unnamed Drainages 1 & 2
AREA OF BASIN WITHIN STUDY AREA:

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION					TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca 3.1 ha	Pinon None	Juniper 775.1 ha	Pinon-Juniper None	Juniper Grassland 258.7 ha	Ponderosa None	Mt. Meadow None				Period	Phase
PaleoIndian														
Archaic					2(100.0)									2 (50.0)
Lithic Unknown							1(100.0)							1 (25.0)
Basketmaker														
BM II														
BM III														
Anasazi														
P I														
P II														
P III														
P IV														
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown					1(100.0)									1 (25.0)

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.22

SITES: N= 8
PERIOD COMPONENTS: N= 8
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 6
Historic: N= 0

DISTRICT: Cerros Del Rio
DRAINAGE BASIN: Unnamed Drainages 3 & 6
AREA OF BASIN WITHIN STUDY AREA: 409.8 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon None	Juniper 286.6 ha	Pinon-Juniper None	Juniper Grassland 123.52 ha	Ponderosa None	Mt. Meadow None	Juniper/Juniper Grassland			Period	Phase
PaleoIndian														
Archaic														
Lithic Unknown														
Basketmaker														
BM II														
BM III														
Anasazi					1 (14.3)		1 (14.3)			5 (71.4)			7 (87.5)	
P I														
P II														
P III														
P IV					1 (16.6)		1 (16.6)			4 (66.6)				6(100.0)
P V *														
Historic										1(100.0)			1 (12.5)	
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Spanish										1(100.0)				1(100.0)
Unknown														

is unlike the other drainages in the study area in that it drains portions of the Sangre de Cristo Mountains. The basin is generally characterized by a low vegetative diversity. Only two of the eleven vegetative communities defined for the study area occur here. The Prickly pear, cholla and yucca community follows the steeper slopes along La Bajada scarp and Santa Fe Canyon. The remaining area in the basin is covered by broad expanses of the juniper grassland community.

Research in this area has been sporadic. The focus, if any can be assigned, has been on recording sites along the north bank of the river. The most extensive work in the area stems from the first surveys and excavations of the Cochiti Dam Salvage Project, Museum of New Mexico. Work in the area includes:

1. an extensive survey by Dittert, Steen and Schroeder in 1962;
2. excavations of sites between 1963-1966, including LA 34, LA 272 and LA 9154;
3. a portion of Schaafsma's petroglyph survey;
4. the excavation of LA 9500 (La Bajada type site) and the location of a few other sites for Irwin-Williams Anasazi Origins Project (1969-1972);
5. an intensive survey by McNeece (1972-1973), part of the roadway to the Tetilla Peak Recreation area;
6. surveys by the Albuquerque Archeological Society (1974-present) in the area around Santa Fe Canyon.

Publication and manuscripts include: Lange (1968); Irwin-Williams (1973); Snow (1971, 1973a).

Perhaps 10% of the land area has been surveyed locating 46 sites with four sites excavated. No PaleoIndian sites have been located; three Archaic sites have been recorded; three Lithic Unknown, two Basketmaker, 31 Anasazi, 11 Historic and four Unknown sites have been documented.

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.23

SITES: N= 46
PERIOD COMPONENTS: N= 54
PHASE COMPONENTS
Basketmaker: N= 2
Anasazi: N= 30
Historic: N= 3

DISTRICT: La Bajada
DRAINAGE BASIN: Santa Fe
AREA OF BASIN WITHIN STUDY AREA: 4509.3 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		UNKNOWN			TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca 334.2 ha	Pinon None	Juniper 265.8 ha	Pinon-Juniper None	Juniper Grassland 3909.3ha	Ponderosa None	Mt. Meadow None		Modern Fields	Unknown	Period	Phase
PaleoIndian														
Archaic							1 (33.3)					2 (66.7)	3 (5.6)	
Lithic Unknown							3(100.0)						3 (5.6)	
Basketmaker							1 (50.0)					1 (50.0)	2 (3.7)	
BM II														0 (0.0)
BM III							1 (50.0)					1 (50.0)		2(100.0)
Anasazi			3 (9.7)				13 (41.9)				1 (3.2)	13 (41.9)	31 (57.4)	
P I							3(100.0)							3 (10.0)
P II			3 (42.9)				2 (28.5)					2 (28.5)		7 (23.3)
P III			1 (11.1)				3 (33.3)					5 (55.6)		9 (30.0)
P IV							5 (55.6)				1 (11.1)	3 (33.3)		9 (30.0)
P V *			1 (50.0)								1 (50.0)			2 (6.7)
Historic			1 (9.1)				4 (36.4)				1 (9.1)	5 (45.5)	11 (20.4)	
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.											1(100.0)			1 (33.3)
Spanish							2(100.0)							2 (66.7)
Unknown							1 (25.0)					3 (75.0)	4 (7.4)	

The lithic sites are located in the juniper grassland community. No information about the character of these sites has been recorded. Several Developmental (BMIII, PI, PII) sites have been recorded in this area. These are generally small sites of one to three pithouses with associated surface or storage rooms. The later sites (PII) are usually somewhat larger. One large PIII pueblo of 75-100 rooms has been recorded. For most of the remaining PIII components, there is no descriptive information. Three large PIV sites and a number of small field houses and ceramic and lithic scatters have been recorded.

4. Cochiti District

The Cochiti District lies south of Bland drainage in the Pajarito and includes both banks of the Rio Grande below White Rock Canyon. The modern vegetative diversity is generally low. Precipitation is similar to that in La Bajada and Cerros del Rio Districts and is lower than that in the Pajarito District. The majority of research in this area was stimulated by the construction of Cochiti Dam and the projected development of the town of Cochiti Lake. Although some sites had been recorded by early researchers such as H. P. Mera (1940), the bulk of the information suitable for this assessment was a result of more recent work, in particular, a survey conducted by Dittert, Steen and Schroeder (Museum of New Mexico 1962) and surveys by Lange and Bussey (for the Museum in 1963). In the northern portion of the district, in the numbered drainage basins, an intensive foot survey was conducted by Snow in 1969-1970. Also a series of sites were excavated in this district by the Museum of New Mexico between 1963-1967.

Seventy sites have been located in the Cochiti District. Of these, five have PaleoIndian components; none have Archaic components; 17 are

lithic sites for which no temporal components can be assigned; 36 have Anasazi components; 14 have Historic components; and three are Unknown. As in the other districts, all of the lithic sites are located in the juniper and juniper grassland communities. These are the dominant communities in this district, however. More of the Anasazi and Historic components are located in the Rio Grande drainage basin than in the other drainages in the district.

a. Rio Grande below White Rock Canyon

Thirty-four of the 70 sites of the Cochiti District are located in the Rio Grande drainage basin (see Table IV.24). This basin encompasses over half of the total land area of the district. Only one lithic site has been recorded in this drainage basin. A few Developmental sites have been documented. These are generally small sites and range from a lithic scatter with associated hearths to a few sites with pithouses during the BMIII and PI phases. While the sites during the PII phase are few, their size is generally large, although the larger sites are associated with PIII components. Consequently, the extent of the PII component of these larger sites is not certain. The PIII components are the most numerous in the drainage. They range in size from one pueblo of five rooms to one of 88 rooms. The modal size for PIII is 20 rooms. Only four PIV components have been recorded. The two PIV sites with descriptive information are medium-large pueblos of 53 and 230 rooms. Both sites were excavated during the Cochiti Dam Salvage Project, Museum of New Mexico. The 230 room pueblo, LA 70, had a small PIII component which was limited to several pithouses. The Historic components include a Spanish garrison (LA 6178) and a series of Spanish rooms in LA 70.

b. Unnamed Drainages 19, 20, 21, 22, 23, and 24

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV. 24

SITES: N= 36
PERIOD COMPONENTS: N= 45
PHASE COMPONENTS
Basketmaker: N= 7
Anasazi: N= 38
Historic: N [illegible]

DISTRICT: Cochiti
DRAINAGE BASIN: Rio Grande below White Rock Canyon
AREA OF BASIN WITHIN STUDY AREA: 1640.2 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE		UNKNOWN	TOTALS	
	Riparian	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon None	Juniper	Pinon-Juniper	Juniper Grassland	Ponderosa None	Mt. Meadow None	Riparian Juniper Modern Fields	Riparian Juniper Grassland Mod. Flds	Modern Fields	Period	Phase
Paleoindian														
Archaic														
Lithic Unknown					1(100.0)								1 (2.2)	
Basketmaker					1 (20.0)		2(40.0)						5(11.1)	
BM II														
BM III					1 (14.3)		4(57.1)			1(14.3)	1(14.3)			7(100.0)
Anasazi					10(41.7)		3(12.5)			5	5	1 (4.2)	24(53.3)	
P I					1(12.5)		4(50.0)			1(12.5)	2(25.0)			8 (20.1)
P II					2(25.0)		2(25.0)			2(25.0)	2(25.0)			8 (20.1)
P III					9(60.0)		2(13.3)			3(20.0)	1 (6.7)			15 (39.5)
P IV					2(40.0)		2(40.0)				1(20.0)			5 (13.1)
P V *					2(100.0)									2 (5.2)
Historic					4(30.8)		2(15.4)			4(30.8)	3(23.1)		13(28.8)	
Post 1600														
17th Cen.														
18th Cen.							1(100.0)							1 (11.0)
19th Cen.														
20th Cen.					1(14.0)					4(57.0)	2(28.0)			7 (77.0)
Spanish					1(100.0)									1(11.0)
Unknown					1(100.0)								1 (2.2)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.25

SITES: N= 20
PERIOD COMPONENTS: N= 23
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 11
Historic: N= 0

DISTRICT: Cochiti
DRAINAGE BASIN: Unnamed Drainages 19,20,21,22,23
AREA OF BASIN WITHIN STUDY AREA:

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon None	Juniper 917.8 ha	Pinon-Juniper None	Juniper Grassland 8.4 ha	Ponderosa None	Mt. Meadow None	Juniper/ Juniper Grassland			Period	Phase
Paleoindian														
Archaic					4(100.0)								4 (17.4)	
Lithic Unknown					7 (87.5)		1 (12.5)						8 (34.8)	
Basketmaker														
BM II														
BM III														
Anasazi					10 (100.0								10 (43.5)	
P I														
P II														
P III					6 (100.0)									6 (54.5)
P IV					5 (100.0)									5 (45.5)
P V *														
Historic														
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown										1(100.0)			1 (4.3)	

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.26

SITES: N= 16
PERIOD COMPONENTS: N= 22
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 2
Historic: N= 0

DISTRICT: Cochiti
DRAINAGE BASIN: #24
AREA OF BASIN WITHIN STUDY AREA: 454.7 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian None	Scrub Oak None	P. Pear, Cholla, Yucca None	Pinon None	Juniper 310.8 ha	Pinon-Juniper None	Juniper Grassland 143.9 ha	Ponderosa None	Mt. Meadow None	Juniper/ Juniper Grassland			Period	Phase
PaleoIndian					2 (40.0)		2 (40.0)			1 (20.0)			5 (22.5)	
Archaic					3 (60.0)		1 (20.0			1 (20.0)			5 (22.5)	
Lithic Unknown					4 (50.0)		3 (37.5)			1 (12.5)			8 (36.4)	
Basketmaker														
BM II														
BM III														
Anasazi					1 (50.0)					1 (50.0)			2 (9.1)	
P I														
P II														
P III														
P IV														
P V *														
Historic					1(100.0)								1 (4.5)	
Post 1680														
17th Cen.														
18th Cen.														
19th Cen.														
20th Cen.														
Unknown										1(100.0)				

Sites located in Drainages 19-24 generally consist of two classes: lithic scatters and small structural sites (see Tables IV.25, 26). Between one and three lithic sites are located in each of the drainages with the exception of drainage number 24 which has 18 lithic sites. Although it is the largest of the unnamed drainage systems, the high frequency of lithic sites over other categories of sites is surprising since no apparent physiographic or vegetative differences exist between the unnamed drainages. As in other drainages and districts, little descriptive information about the character of the lithic sites has been recorded. For the Anasazi Period sites, only PIII and PIV components are represented. These sites range from ceramic scatters with a possible masonry structure (field house?) to a 13 room pueblo. The PIII component sites are generally larger than the PIV component sites.

5. Rio Grande in White Rock Canyon

This section will summarize the status of research in the Rio Grande drainage basin north of the mouth of White Rock Canyon and includes the area in White Rock Canyon and portions of the mesa tops which drain directly into the Rio Grande (see Fig. III.1). Although the permanent pool of Cochiti Reservoir lies almost entirely in this district, this section only summarizes the research conducted prior to the intensive survey of the permanent pool. This district is the most diverse outside of the Pajarito Plateau. Seven vegetative communities within the Upper Sonoran Life Zone occur in this drainage. Juniper and juniper grassland are the dominant communities. The faunal diversity is high with a number of fish and seasonally available water fowl. All of the previous research in the canyon is relatively recent. Part of the 1963 and 1966 surveys (Lange and Bussey and Schaafsma, respectively), which were associated with the

Cochiti Dam Salvage Project passed through the lower end of White Rock Canyon. In 1969-1970, archeologists from Southern Illinois University conducted a survey of the eastern section of the Canada de Cochiti Grant (James Webb Young Ranch) which included a portion of White Rock Canyon between Bland and Capulin Canyons. A later assessment of the grant conducted by archeologists from the University of New Mexico (Flynn and Judge 1973) resurveyed portions of the same area. The most recent work in the canyon aside from the survey under the present contract, was conducted by archeologists from the National Park Service on those lands in the canyon which lie in Bandelier National Monument. This work has included both survey and excavation (see the Pajarito section on Alamo Canyon).

Sixty-seven sites have been located in this district. The lithic sites include one PaleoIndian component, six Archaic components and four Lithic Unknown components. Of the 34 Anasazi components recorded, three have PII components, 15 have PIII components, 17 have PIV components and five have PV components. Nineteen historic sites have been noted and 13 sites are of unknown period. The range in size for sites in the canyon is similar to the other districts in the study area. The lithic sites are generally small debitage scatters with occasional ground stone and are periodically associated with hearths. The Anasazi sites range from one room structures to a 150 room PIII-PIV pueblo (LA 5137). The single component PIII sites range from 2-17 rooms in extent and the single component PIV sites range only from one to two rooms each. The Historic sites include isolated masonry structures and shelters, sheep pens, terraces, isolated storage structures and corrals. The majority of all sites in the canyon regardless of period appear to be small, limited activity areas.

ASSESSMENT: CULTURAL RESOURCES AND ECOLOGICAL COMMUNITIES

TABLE IV.27

SITES: N= 67
PERIOD COMPONENTS: N= 77
PHASE COMPONENTS
Basketmaker: N= 0
Anasazi: N= 40
Historic: N= 6

DISTRICT: White Rock Canyon
DRAINAGE BASIN: Rio Grande
AREA OF BASIN WITHIN STUDY AREA: 5939.67 ha

ECOLOGICAL COMMUNITIES

PERIODS & PHASES	UPPER SONORAN							TRANSITION		ECOTONE			TOTALS	
	Riparian 11.99 ha	Scrub Oak 66.7 ha	P. Pear, Cholla, Yucca 1031.2 ha	Pinon 261.3 ha	Juniper 2918.5 ha	Pinon-Juniper 82 ha	Juniper Grassland 1501.0 ha	Ponderosa None	Mt. Meadow None	Juniper/Juniper Grassland	Pinon-Juniper/Juniper Grassland	Juniper P. Pear Cholla Yucca	Period	Phase
PaleoIndian							1(100.0)						1 (1.3)	
Archaic					2 (33.3)		2 (33.3)			2(33.3)			6 (7.8)	
Lithic Unknown					2 (50.0)					1(25.0)		1(25.0)	4 (5.2)	
Basketmaker														
BM II														0
BM III														0
Anasazi			5(14.7)	3 (8.8)	14(41.2)	2 (5.9)	2 (5.9)			4(11.8)	2 (5.9)	2 (5.9)	34(44.2)	
P I														0
P II				1(33.3)							2(33.3)			3 (7.5)
P III				2(13.3)	6(40.0)	1 (6.7)	1 (6.7)			1 (6.7)	2(13.3)	2(13.3)		15(37.5)
P IV			1 (5.9)		10(58.8)		2(11.8)			3(17.6)		1 (5.9)		17(42.5)
P V *					3(60.0)					2(60.0)				5(12.5)
Historic			2(10.5)		13(68.4)					3(15.8)		1 (5.3)	19(24.7)	
Post 1600					1(33.3)					1(33.3)		1(33.3)		3(50.0)
17th Cen.					2(100.0)									2(33.3)
18th Cen.														
19th Cen.														
20th Cen.					1(100.0)									1(16.7)
Unknown			2(15.4)		6(46.2)	3(23.1)				1 (7.7)		1 (7.7)	13(16.9)	

C. Summary: Cultural Resources in Study Area

Research has been conducted in the study area for nearly 100 years. The character of this work has been inconsistent and the focus has shifted from the excavation of large PIV sites in the Pajarito District at the beginning of the twentieth century to survey and limited excavation more recently. The survey work, which constitutes the majority of recent research, while recording the presence of many sites, has generally resulted in little information about the character and/or distribution of these sites. With the exception of Hewett (1953) little attention has been afforded to an interpretation of the archeological resources in a regional context.

Lithic sites have only been located in the juniper and juniper grassland communities in the more southernly portions of the study area. These sites are generally small and are occasionally associated with hearths or fire-cracked rock (see Table IV.28). A few of these sites have been intensively examined (see Snow 1973c), but for the most part, little information about the character of activities at these sites or the articulation between these sites with other contemporaneous sites has been attempted. For those sites that have been documented, most researchers have presumed manufacturing or quarrying activities. The temporal control for these sites is poor. The majority cannot be assigned to a temporal period (and hence have been assigned to Lithic Unknown). Those that have been labled PaleoIndian or Archaic have been so assigned on the basis of the presence of "diagnostic" artifacts.

Information about the Anasazi Period of occupation for the study area is much better defined and is summarized in Tables IV.29-34. A general regional chronology, correlated with ceramic sequences, was

TABLE IV.28

Summary of Lithic Sites*

	PaleoIndian Lithic	PaleoIndian Hearths	Archaic Lithic	Archaic Hearths	Lithic Unknown Lithic	Lithic Unknown Hearths
Pajarito Plateau District						
Bland	3	-	5	-	7	1
Rio Chiquito	-	-	1	-	8	-
Sanchez	-	-	-	-	-	-
Medio	-	-	-	-	-	-
Capulin	-	-	-	-	-	-
Alamo	-	-	-	-	-	-
Lummis	-	-	-	-	-	-
Rito de los Frijoles	-	-	-	-	-	-
Chaquehui	-	-	-	-	-	-
Ancho	-	-	-	-	-	-
Water	-	-	-	-	-	-
Potrillo	-	-	-	-	-	-
Three Mile, Cedro	-	-	-	-	-	-
Pajarito	-	-	-	-	-	-
Canada del Buey	-	-	-	-	-	-
Mortandad	-	-	-	-	-	-
Sandia	-	-	-	-	-	-
Los Alamos	-	-	-	-	-	-
Cerros del Rio District						
Santa Cruz	-	-	1	-	3	-
Tetilla (Canada de Cochiti)	-	-	-	-	1	-
Arroyo Montoso	-	-	-	-	-	-
Unnamed 1	-	-	1	-	-	-
2	-	-	1	-	1	-
3	-	-	-	-	-	-
4	-	-	-	-	-	-
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
11	-	-	-	-	-	-
12	-	-	-	-	-	-
13	-	-	-	-	-	-
14	-	-	-	-	-	-
15	-	-	-	-	-	-
La Bajada District						
Santa Fe	-	-	3	-	3	-
Cochiti District						
Rio Grande below White Rock Canyon	-	-	-	-	2	-
Unnamed 16	-	-	-	-	-	-
17	-	-	-	-	-	-
18	-	-	-	-	-	-
19	-	-	-	-	2	-
20	-	-	2	-	1	-
21	-	-	-	-	2	-
22	-	-	1	-	2	-
23	-	-	1	-	1	-
24	5	-	5	-	8	-
White Rock Canyon District						
Rio Grande above mouth of White Rock Canyon	-	-	5	1	3	1
TOTALS	8	0	26	1	44	2

* "Lithic" refers to those sites which are characterized by lithic scatters only; "hearths" include those sites with the presence of hearths in addition to debitage.

developed in the first half of the twentieth century (Mera 1932, 1933; Hawley 1936). Although previous work has been more intensive in some geographic areas than others (principally the Pajarito Plateau), clear patternings in the distribution of sites through time emerge. A few early Anasazi sites, usually termed the Developmental (BMIII, PI, PII) from A.D. 600-1200, have been recorded in the study area. Although some have been noted in the Pajarito Plateau District, the majority of these occur adjacent to or in the modern flood plains of the Rio Grande or Santa Fe drainages (Cochiti and La Bajada Districts). These sites are generally small with one to three pithouses with associated surficial storage structures. Most of the documented Developmental sites belong to the latest phase, PII. Very few of the earliest sites, BMIII and PI are known. Some PII sites are associated with PIII components. These sites have a tendency to be larger than the single component PII sites. The extent of the PII component at these multicomponent sites is not known, however.

By A.D. 1200-1325 (Coalition or PIII) the number of Anasazi sites increases dramatically. Over 363 PIII components have been documented for the study area. The PIII sites occur in all the districts that have been defined above. Their density is greatest in the Pajarito District, but it is high throughout the study area. The range of size for PIII sites is extensive (see Table IV.31). Although the majority of PIII sites range from 6-10 rooms in extent, 11-30 room sites (or medium sized sites) constitute a class of sites that occur in PIII times but are rare for any other phase (see Table IV.32). The presence of kivas has been documented for both the small and medium size sites (see Table IV.33). It is possible that this range in size may reflect more than one adaptive strategy

or a seasonality in occupation. In the northern portion of the study area large PIII sites have been recorded, documenting the first tendency toward aggregation.

By A.D. 1325 (beginnings of PIV or Classic) the tendency for aggregation becomes the dominant settlement strategy. A number of large PIV sites have been documented throughout the study area. Most major drainage systems have one or two large PIV sites. These appear to be surrounded by several small, one to three room sites (field houses?) with terraces and/or specialized lithic and ceramic scatters (see Tables IV.31 and IV.34). These smaller sites may indicate an intensification in land use by an aggregated set of populations. The majority of the PIV sites in the study area are early Glaze A or B sites. The later glaze sites reduce in number and there is some indication that the population may have been moving out of the study area. Two hundred thirty-three PIV have been recorded in the study area (see Table IV.29).

Historic Period sites have been poorly documented until recent surveys. Those sites that have been recorded range from large Pueblo Revolt Period sites (LA 295--Kotyiti) to sheep pens, field houses, terraces, corrals, etc. The character of adaptation for the Historic Period (A.D. 1540 - present) is extremely complex. Seven phases have been defined (Exploration, Colonization, Revolt and Reconquest, Colonial, Mexican, Territorial, Statehood-Modern) and these are summarized in Section VI-D (see Table IV.35).

Over 203 sites were recorded in the survey for which no temporal period could be assigned. These sites were generally structural and ranged from 1-28 rooms in extent. Many petroglyphs, terraces and shelters were included in the category.

TABLE IV.29

Frequency of Basketmaker and Anasazi Phase Component*

	BMII	BMIII	PI	PII	PIII	PIV	PV
<u>Pajarito Plateau District</u>							
Bland	-	-	-	-	36	28	-
Rio Chiquito	1	-	-	3	90	91	46
Sanchez	-	-	-	1	3	11	-
Medio	-	-	-	-	5	10	-
Capulin	-	-	-	-	4	6	-
Alamo	-	-	-	-	2	5	-
Lummis	-	-	-	5	56	12	-
Rito de los Frijoles	-	-	-	4	28	4	1
Chaquehui	-	-	-	-	3	-	-
Ancho	-	-	-	-	20	7	-
Water	-	-	-	-	15	-	-
Potrillo	-	-	-	-	5	-	-
Three Mile, Cedro	-	-	-	-	2	-	-
Pajarito	-	-	-	1	16	3	-
Canada del Buey	-	-	-	-	10	1	-
Mortandad	-	-	-	1	7	1	-
Sandia	-	-	-	-	6	1	-
Los Alamos	-	-	-	1	4	5	2
<u>Cerros del Rio District</u>							
Santa Cruz	-	-	-	-	-	-	-
Tetilla (Canada de Cochiti)	-	-	-	-	-	3	-
Arroyo Montoso	-	-	-	-	-	-	-
Unnamed 1	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	1	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	4	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-
<u>La Bajada District</u>							
Santa Fe	2	2	3	7	9	9	2
<u>Cochiti District</u>							
Rio Grande below White Rock Canyon	-	7	8	8	15	5	2
Unnamed 16	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-
20	-	-	-	-	3	1	-
21	-	-	-	-	3	3	-
22	-	-	-	-	6	5	-
23	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-
<u>White Rock Canyon District</u>							
Rio Grande above mouth of White Rock Canyon	-	-	-	3	15	17	5
	3	9	11	34	363	233	59

* For this table a site is entered for each component represented, i.e. a PII-PIII site is entered under both PII and PIII.

TABLE IV.30

Anasazi Phases by Size* and by Community

1. Riparian/Canyon Riparian

	BMIII	PI	PII	PIII	PIV	PV
Small						
Medium				1		
Large						

2. Juniper Grassland

	BMIII	PI	PII	PIII	PIV	PV
Small	2	3	1		3	
Medium				1		
Large				2	5	

3. Juniper

	BMIII	PI	PII	PIII	PIV	PV
Small	1	1	3	79	80	31
Medium				32	14	4
Large			2	7	6	2

4. Pinyon

	BMIII	PI	PII	PIII	PIV	PV
Small			1	27	7	
Medium				30	1	
Large			2	10	4	2

5. Pinyon-Juniper

	BMIII	PI	PII	PIII	PIV	PV
Small				5	6	
Medium						
Large			1	1	1	

6. Prickly Pear, Yucca, Cholla

	BMIII	PI	PII	PIII	PIV	PV
Small				1		
Medium				1		
Large					2	

7. Ponderosa

	BMIII	PI	PII	PIII	PIV	PV
Small				6	3	
Medium				7	2	
Large				3		

8. Ecotones

	BMIII	PI	PII	PIII	PIV	PV
Small		1	2	10	14	
Medium			2	18	4	
Large				4	3	3

* See Appendix A for a discussion of the category of size. Small includes those sites labled as small or those sites of 1-10 rooms; medium (11-30 rooms); large, greater than 30 rooms.

TABLE IV.31

Absolute Room Counts by Anasazi Phase*

No. of Rooms	Anasazi Phases							
	PII	PIII	PIV	PV	PII-PIII	PIII-PIV	PIV-PV	PIII-PV
1	1	11	32		1	10	2	1
2		6	16	5		5		1
3-5		13	15	5		9		2
6-8		28	2	2		6		1
9-10		9				1		
11-15	1	16	1			8		
16-20		14				4		
21-25		4				1		
26-30		7				1		
31-40					1			
41-50		3						
51-60			1					
61-70		1	1		1			
71-80		1			1			
81-90		2	1					
91-100						1	1	
101-150			1	2		3		
151-200								
201-250								
251-300								
300-500			1		1			
800							1	

* When the room counts for a site were stated as a range (8-10 rooms; 10-20 rooms), the difference between the range was averaged and that number was entered in this chart.

TABLE IV.32

Site Size by Anasazi Phases

	Anasazi Phases											
Size *	BMIII	PI	PII	PIII	PIV	PV	BMIII-PI	PI-PII	PII-PIII	PIII-PIV	PIV-PV	PIII-PIV-PV
Small (1-10 rooms)			1	72	65	12	1	2	3	34	2	5
Medium (11-30 rooms)			1	67	1	1				19		
Large (31-800 rooms)				15	10	2			4	6	2	2

* These size categories include all sites with room counts as defined in the parentheses in addition to all sites labled small, medium or large. See Appendix A for a discussion of the category of size.

TABLE IV.33

Anasazi Sites and Kivas

No. of Rooms	PIII	PIV	Size of Site	Number of Sites Represented PIII	PIV
3	+		medium	4	
4	+	+	large	4	1
5	+			1	
6	+			1	
7	+			1	
8	+			1	
10	+			2	
11	+			1	
13	+			3	
15	+			2	
18	+			3	
20	+			5	
23	+			1	
25	+			3	
28	+			1	
30	+			2	
50	+			1	
63		+			1
75	+			1	
88	+	+		2	1
800		+			1

TABLE IV.34

Non-Structural Anasazi Sites

	PI	PII	PIII	PIV	PV	PIII-PIV	PIV-PV	PIII-PV
Lithic/Ceramic Scatter	1	1	4	17		4	2	
Rock Shelter				4			2	1
Terraces			1	7		1	2	

TABLE IV.35

Frequency of Historic Components*

	Historic	PV	Post 1680	17th	18th	19th	20th	Spanish
Pajarito Plateau District								
Bland	-	-	-	-	-	-	-	-
Rio Chiquito	61	46	-	1	3	-	-	3
Sanchez	2	-	-	-	-	-	1	-
Medio	5	-	-	-	2	-	-	-
Capulin	-	-	-	-	-	-	-	-
Alamo	4	-	-	-	-	-	-	-
Lummis	-	-	-	-	-	-	-	-
Rito de los Frijoles	-	-	-	-	-	-	-	-
Chaquehui	-	-	-	-	-	-	-	-
Ancho	-	-	-	-	-	-	-	-
Water	-	-	-	-	-	-	-	-
Potrillo	-	-	-	-	-	-	-	-
Three Mile, Cedro	-	-	-	-	-	-	-	-
Pajarito	-	-	-	-	-	-	-	-
Canada del Buey	1	1	-	-	-	-	-	-
Mortandad	-	-	-	-	-	-	-	-
Sandia	1	-	-	-	-	-	-	-
Los Alamos	1	1	-	-	-	-	-	-
Cerros del Rio District								
Santa Cruz	-	-	-	-	-	-	-	-
Tetilla (Canada de Cochiti)	-	-	-	-	-	-	-	-
Arroyo Montoso	-	-	-	-	-	-	-	-
Unnamed 1	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-	-
6	1	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-
13	-	-	-	-	-	-	-	-
14	-	-	-	-	-	-	-	-
15	-	-	-	-	-	-	-	-
La Bajada District								
Santa Fe	11	2	-	-	-	-	1	2
Cochiti District								
Rio Grande below White Rock Canyon	13	2	-	-	1	-	7	1
Unnamed 16	-	-	-	-	-	-	-	-
17	-	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-	-
19	-	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-	-
21	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-
23	-	-	-	-	-	-	-	-
24	1	-	-	-	-	-	-	-
White Rock Canyon District								
Rio Grande above mouth of White Rock Canyon	19	5	3	2	-	-	1	-
TOTALS	120	57	3	3	6	0	10	6

* The information derived from previous research was too inexact to be presented by Historical Phases (Exploration, Colonization, etc.).

V. Intensive Survey of Permanent Pool - Cochiti Reservoir

A. Goals

Intensive archeological survey of the permanent pool level of Cochiti Reservoir was undertaken with the intent of locating and documenting information about all surficial archeological remains present below the 5322' contour level upstream from Cochiti Dam. The survey was implemented as one phase of a multi-stage program of assessment and mitigation of cultural resources to be inundated by the Cochiti Reservoir. As such, documentation of archeological remains to be affected was directed toward description of those remains to permit evaluation of their significance. Theoretical considerations underlying specific survey procedures employed to document variability among the archeological remains encountered within the project area will be discussed briefly.

Archeological remains constitute material by-products of human behavior. Such material by-products do not exhibit innate qualities of significance through mere existence upon the landscape, but rather become significant when used as data to inform about the behavior which resulted in their deposition.

Given the long temporal span and great diversity of cultural behavior apparent in the near vicinity of the project area known from previous anthropological and archeological research, intensive survey of the permanent pool was directed toward documenting archeological remains in a way which would allow them to be used as information about the operation of previous cultural adaptive systems within the project area. These information needs dictated that four realms of variability be documented for all occurrences of material by-products encountered:

1. Information concerning the present spatial and environmental content of the remains;

2. Information concerning the relative or absolute dates of manufacture and deposition of the remains;

3. Information concerning the technological contexts of manufacture of features and artifacts comprising the remains;

4. Information concerning the subsistence contexts of use of features and artifacts comprising the remains.

The following section will outline methodological considerations of survey implementation.

B. Methodological Considerations

1. No Collection Strategy

The intent of legislation under which intensive survey of the Cochiti Reservoir permanent pool was implemented is that of recognizing archeological remains as limited and non-renewable cultural resources. It is a well known and accepted fact that any archeological investigation of a site location which involves removing artifactual remains from their context of occurrence is a form of physical destruction of the archeological record. This is manifestly obvious if such removal involves excavation, and it is in recognition of this fact that the professional archeological community places such great emphasis upon training in observation and recording the contextual relationships of artifactual remains recovered during the course of excavation.

Removal of artifactual remains from the surface of site locations constitutes no less a destruction of the contextual relationships which pertain among artifactual and architectural remains comprising the site location. This is especially true in those cases in which the behavioral

contexts of deposition and the vagaries of post-depositional erosional process have resulted in an ephemeral and often entirely surficial record of human behavior at a particular spatial loci.

When archeological survey for cultural resources management purposes is examined in light of alternatives which might be recommended for mitigating the destruction of specific site locations, policies of artifact collection cannot be justified legally or ethically for the simple reason that one viable mitigative alternative is avoidance, or physical preservation of site locations.

Archeological resources situated within the confines of the Cochiti Reservoir permanent pool constitute in many ways a special case with regard to this mitigative alternative, in that all will be subjected to varying degrees of shoreline wave action, inundation and silt deposition in the future. While the effects of these processes are poorly understood at present, archeological data from the Van Norman Reservoir, Los Angeles County, California suggest that reservoir inundation does not necessarily substantially destroy the physical character of the archeological record, and with respect to some classes of material enhances preservation through time (Wessel, personal communication). Given these considerations, avoidance or physical preservation of archeological resources within projected permanent pool limits can be considered a potentially viable mitigative alternative, although the time span of inundation is of a rather large order of magnitude.

A second consideration which must be taken into account when dealing with the impact of survey collection policies resides in the potentially detrimental effect artifact collection during survey might have upon the scope of problem oriented analysis of site locations selected for mitigative

action through excavation in the future. Selective removal of "diagnostic" artifacts, or areal intensive collection from site surfaces can severely limit the scope of research problems necessitating spatial analysis of artifact distributions across the site location undertaken during excavation.

For these reasons, a decision was made to implement a no collection strategy in documenting artifactual variability during intensive survey of the Cochiti Reservoir permanent pool area.

2. Defining Units of Observation

One of the most common topics of professional debate which arises when survey methodology discussed centers about the question "When do you call a site a site?" This question is predicated upon the fact that material evidence of past human behavior exhibits a considerable range of variability in its distributional density across the landscape. Thus, the archeological record of past human behavior within any project boundaries can be expected to vary from isolated artifacts, "scatters" of artifacts, to spatial loci characterized by great numbers of architectural features and high densities of artifactual remains. The problem facing the archeologist is that of determining how this variability should be documented so it can be used as data to inform about past human behavior. In the past, a commonly employed strategy has been to define "sites" or "site locations" as units of observation. Sites are generally defined as high density clusters of architectural and artifactual remains occurring within definable spatial limits which are presumed to represent spatial loci of high intensity or long duration of human activities.

If the archeological record is viewed as representing the material by-products of human adaptive systems, however, restricting documentation solely to such high-density clusters would potentially limit and thus bias

the amount of information about the operation of adaptive systems within a project area. In this sense, the spatial structure of varying densities of material by-products across the landscape constitutes in itself contextual informative which informs on the organizational relationships which pertain between behavioral components of an adaptive system.

For this reason, three units of observation were defined for the survey: isolated occurrences, site locations, and proveniences within site locations.

a. Isolated Occurrences

Isolated occurrences are defined as single occurrences of artifact or features; or as low density scatters of artifactual remains over very broad areas of landscape. These units of observation are differentiated from "site locations" because they provide information about subsistence or settlement behavior primarily through analysis at a regional rather than loci-specific scale. In this sense, a single isolated sherd dating in manufacture to a particular period of Anasazi settlement may offer little or no information about specific subsistence activities carried out at the exact spatial loci where it is found; but the distribution of such isolated occurrences with respect to particular physiographic, soils and vegetative zones within a region may prove quite informative about strategies of land usage during that period of settlement. Distributions of isolated occurrences offer considerable potential in isolating contexts of prehistoric trail usuage, location and intensity of usage of agricultural fields, etc.

b. Site Locations

Site locations are defined as clusters of artifactual and/or architectural features which can be delimited spatially to a particular locale upon the landscape. Site locations are felt to represent spatial

locales which potentially can provide information about loci-specific subsistence pursuits through analysis of material remains. In this sense, site locations are differentiated from isolated occurrences as units of observation because they exhibit artifactual and/or achitectural variability indicative of greater intensity, diversity or duration of behavioral components at a particular spatial loci upon the landscape.

c. Provenience

Site locations vary considerably in size, composition and density of material remains, a major procedural problem during field survey resides in stratifying these remains into intra-site units of observation which maximize information about the behavioral and temporal contexts of deposition at the site location. To facilitate this stratification, two kinds of intra-site proveniences were defined, based upon expectations of depositional history.

In many cases, site locations will owe their existence to the operation of a single adaptive system in the past, and will have been selected as spatial loci where a specific set of subsistence pursuits were carried out. Such site locations can be termed "single component" sites in that the spatial organization and content of the material remains are attributable to only one adaptive system.

Intra-site variability in spatial location and density of material remains at such site locations is potentially informative about a variety of problems concerning kind and diversity of subsistence pursuits carried out, size and organization of population segments undertaking those subsistence pursuits, and duration or intensity of task-specific implementation of subsistence pursuits. To maximize recovery of such information, spatial proveniences within the site location can be defined employing

criteria of content and density of architectural and artifactual remains.

In some cases, entire site locations may be defined as "single provenience" sites through employing these criteria; but in many other cases, these criteria permit definition of several such proveniences.

Many other site locations upon the landscape can be expected to have been selected as loci for specific sets of subsistence pursuits by more than one cultural adaptive system in the past. Given the particular extractive or productive strategies for which those spatial loci were selected by differing adaptive systems, the material by-products of subsistence oriented behavioral sets may exhibit quite different spatial organization at the site location, and may exhibit considerable diversity in assemblage composition as monitored by technological, functional or architectural variability.

Field definition of proveniences in these cases cannot be expected to isolate different temporal components if the material remains covary spatially, but must be oriented toward isolating spatially segregated distributions of artifactual and architectural remains based upon density relationships. In some cases, the context of utilization of site space can be expected to result in differential spatial deposition of material remains by different temporal components, while in other cases material remains attributable to different temporal components are essentially "stacked" at the same spatial loci within the site. This kind of complexity in deposition can be resolved, however, only if spatially defined proveniences within the site location are treated as individual units of observation within which architectural and artifactual variability is monitored.

3. Sampling Procedures

a. Procedures to Locate

A four man crew was employed to locate presence of architectural and artifactual remains within the project area. Given the highly convoluted nature of the landscape, intensive foot survey was conducted sequentially over small pre-determined portions of the land surface. Interval spacing of survey personnel ranged from 10-15 meters dependent upon vegetational cover and physiographic considerations, and ground coverage by each crew member was undertaken in a 'zig-zag' fashion.

Each crew member was equipped with a bundle of color coded 30" wire flags for marking loci of architectural or artifactual remains, and voice contact was maintained between personnel during locational sweeps of the portion of landscape being surveyed.

Upon completion of this locations stage, a brief conference was held to exchange information on the kind and densities of archeological remains encountered. Stratification of archeological remains into categories of isolated occurrence or site location was determined through evaluation of density relationships of artifactual or architectural phenomena. At this point, decisions were made to intensively re-examine spatial loci which were characterized by high densities of artifactual debris and areas characterized by high densities of isolated occurrences as determined by flagged location and voice contact.

b. Definition of Units of Observation

Spatial loci of high density material remains and low density remains as defined above were subjected to a "flag sweep" by survey personnel in which crew members spaced themselves approximately 2 meters apart and set flags by each artifact within the site location. Flag colors were assigned to taxons of artifactual remains--red flags signifying silicious stone artifacts, yellow flags signifying ceramic fragments, white flags signifying

non-silicious stone artifacts, etc.

This procedure enabled the survey crew as a whole to visually assess the limits and density of artifactual detritus comprising the site location, and as well to visually assess intra-site variability in density distributions of classes of artifactual debris within the site location.

In cases where artifactual remains were present in extremely high densities, this procedure was altered toward definition of spatial limits of densities boundaries for the site location as a whole, and differential limits of density distributions within the site location boundaries.

Upon completion of the "flag sweep" of a site location, another brief conference was held during which the structure of variability among classes of architectural and artifactual debris was evaluated according to criteria of spatial association and desntiy relationships. Determinations of provenience locales within the site boundaries were arrived at through consensus, sampling strategies were defined and documentation tasks were assigned during this conference. The operational value of the visual display of color coded flags across the site location cannot be overemphasized in importance for making decisions at this point.

c. Decision to Sample

Data recording strategy dictated that all architectural features within each designated provenience be documented in detail. With respect to artifactual debris, including ceramics, lithics and historic artifacts, decisions to document all items visible on the surface or to document a sample of those items were made employing practical time/cost criteria based upon item counts within provenience limits. Initial item count estimates were made for each provenience after the "flag sweep" of the entire site location was undertaken. In those cases where artifact class densities within provenience loci were

low (ca. 30 items or less), all items visible on the surface were documented on appropriate ceramic, lithic or historic artifact data forms.

If, however, the initial "flag sweep" of the site location resulted in definition of provenience loci characterized by high densities of artifactual remains, a decision was made to document a spatially bounded sample of artifactual debris within each provenience. Two considerations were involved in definition of size, shape and placement of sample units within provenience boundaries. These included an attempt to representatively sample the artifactual content variability exhibited by the provenience locale, and to representatively sample the artifact class density within the provenience locale, such that sample unit descriptions of artifactual variability could be used analytically in rigorous comparative fashion with "whole provenience" documentation of artifact variability.

Quadrat or essentially square sample units were initially employed within provenience locales for this purpose, but were discarded for the following reasons.

1) Many site locations were situated on sloping terrain and it was perceived in some cases that erosional "sorting" had occurred from the top to the bottom of the slopes. More massive artifacts tended to be distributed near the tops of the slopes, while artifacts of smaller mass such as small pieces of debitage were distributed in much greater frequencies near the lower reaches of the sloping surface. Quadrat samples, being restricted in their placement to a single block size portion of the provenience area, did not encompass the entire artifact size variability exhibited at the provenience because of their shape.

2) For the first few site locations in which quadrat samples were employed, it was observed that a great deal of lithic and ceramic class

or taxon variability was not being representationally encompassed within the sample unit.

A decision was thus made to implement a transect sampling strategy. Linear rectangular sample units were laid out across the provenience locale to maximize monitoring of assemblage variability as conditioned by both contexts of behavioral deposition and post-deposition erosional processes. In the cases of proveniences situated on sloping terrain, these sample transects were oriented essentially uphill-downhill. Size of transects was adjusted to collect a minimum of 25 artifacts, and was thus largely determined by density of artifactual remains within provenience locales. Actual size of transects varied from 1.0 to 3.0 meters wide and from 2.0 to 18.0 meters long.

It should be noted that sample units within provenience locales were employed to document only artifact classes exhibiting high item counts. Thus, if a provenience locale exhibited high counts of lithic artifacts but low counts of ceramic fragments, sample transects were employed to document lithic artifact variability while all ceramic variability within the provenience locale was documented.

Of the two sample units employed (quadrats and transects), it was determined in the field that transect samples provided a more reliable estimate of artifact size variability within a given provenience because it accounted for post-depositional erosional sorting of artifactual debris. Assessing the degree to which quadrat or transect samples provide better estimations of artifact class variability within a provenience locale is a somewhat more difficult problem which can only be approached through analysis of completely collected or excavated site locations. It was noted in the field that low-count artifact classes (such as manos, metates or projectile points) were often not accounted for by either quadrat or

transect sample units. For this reason, survey procedure was altered during the course of field work such that low-count artifact classes "missed" by transect sample unit placement within a provenience locale were documented in addition.

C. Data Collection Procedures

A series of data forms were employed to describe relevant variability concerning the spatial location and environmental setting of site locations and isolated occurrences, and to describe architectural and artifactual variability within provenience locales at site locations. Data recorded on these forms will be discussed below, and the reader is referred to figures (V.1-7) for reproductions of each form.

The general strategy of description involved recording general information about the setting, kind and relationship of proveniences and areal extent of a site location on the Site Data Form. Specific descriptions of architectural features and extent of artifactual debris were recorded on the Provenience Data Form; while documentation of artifactual variability within provenience locales was undertaken employing the appropriate Lithic, Ceramic, Historic Artifact or Petroglyph data forms.

1. Site Data Form (Figure V.1)

The site data form was designed to act as a "cover sheet" for each site location which contained three categories of information. These included a variety of essentially locational and bookkeeping data, some of which was documented in the field and some of which was documented in the laboratory; data concerning the physiographic setting and situation of the site location; data concerning the vegetational setting of the site location; and, if the site location was a single provenience site, data concerning the kind, number and relationships of architectural and artifactual remains characterizing the site location.

SITE DATA FORM

LA #__________ Other Designations__________

Project__________ Cultural/Temporal Type__________

Elevation__________' __________M. Long__________ Lat __________

USGS Quad__________ T____ R____ Sec____ ¼ Sects__________

Drainage: Primary__________ Secondary__________

Field #__________ Date__________ Recorder__________

Physiographic Setting:
Description:

Physiographic Situation: Exposure______ Slope______ Soil Structure__________
Description:

Vegetation:
Dominant Species:

Vegetative Structure:

Number of Proveniences:____

Kind and Relationship of Proveniences:(if single provenience site,. list forms

Forms: Lithic__ Ceramic__ Historic__ Petroglyph__ Maps__

Dimensions of Site__________

Site Condition: Eroded__ Vandalized__ Undisturbed__ Surficial__ Stratified__
Comments:

Mitigation Estimate(man-hours): Intensive Collection_____ Excavation_______
Comments:

Photo #'s: B/W__________Color__________

Figure V.1 Site Data Form

Documentation of locational data, including LA number, other names or numbers previously assigned to the site location, project name, cultural/temporal designation, elevation, UTM coordinates, etc., was undertaken after the data form was returned from the field. Information such as field number, date and name of recorder, site condition, mitigation estimates, photo numbers, site dimensions, number of proveniences and data forms employed to describe architectural and artifactual variability were filled out in the field.

Three classes of physiographic and vegetational information were monitored for each site location and will be discussed briefly here.

a. Physiographic Setting

Physiographic setting was defined as a brief notation concerning the gross locational and geomorphological setting of the site location with reference to named landforms such as canyons, mesas, river, etc. Examples of physiographic setting descriptions are: "West bank of Rio Grande River in White Rock Canyon, ca. 150 meters downstream from mouth of Medio Canyon." Physiographic settings were not considered to be data for future analysis, but rather as locational descriptions conveying a somewhat different kind of information than that contained in UTM coordinates or township/range/quarter-section descriptions of site location.

b. Physiographic Situation

Physiographic Situation is a description of the immediate exposure, slope, soil structure, substrate and landform of the site location. Exposure was noted according to the "eight cardinal directions" such as north, northeast, east, southeast, etc., while slope was entered in degrees estimated from USGS contour maps. Soil structure was described according to formation and composition such as "unstabilized aeolian dune

sands" or "shallow colluvial sand and silts deposited over basalt talus substrate."

Landforms descriptions for physiographic situation emphasized placement of the site location with respect to the immediately surrounding landscape. Landform variability within the project area was quite diverse, and an attempt was made to document in detail the location of each site with respect to this variability, including talus slopes, benches, alluvial fans, dune structures, cobble beaches, terraces, and drainage channels among others. Nine classes of physiographic situation were ultimately defined to categorize this landform variability and are summarized in the introduction to Appendix B.

c. Vegetation

Dominant tree, shrub and grass species characteristic of the vicinity surrounding the site location were listed under "Dominant Species." Vegetative cover of the site location itself was not monitored because of an expectation that in some cases the presence of the site location would have a substantial effect upon the kind, diversity and structure of vegetative cover present at the site itself.

Vegetative structure was documented as a description of variability in horizontal and vertical patterning and density of dominant species within the vicinity of the site location, such that "ground truth" assessments of aerial photogrammetric techniques for documenting vegetational variability could be made. Six classes of vegetative structure were ultimately defined and are summarized in Appendix B.

If the site was defined as a single provenience site location, the provenience description was entered under 'Kind and Relationship of Proveniences.' If more than one provenience was defined at the site location,

their kind, spatial, physical and possible temporal and functional relationships were described under that heading.

2. Provenience Data Form (Fig. V.2)

Aside from essentially bookkeeping information accounted for on the initial three lines of the form, provenience data was described according to an "open" format. The following set of criteria were employed to organize provenience descriptions.

a. Structures (including rubble mounds, rooms, walls, depressions, etc.)

i) Dimensions (length, width and height) of rubble mound(s) or structure.

ii) Number of rooms discernable by foundation outlines, and dimensions of each.

iii) Constructional details:
Materials (basalt, tuff, adobe, wood, etc.)
Kind of elements (Clasts, slabs, cobbles, etc.)
Size of elements (ranges and means of length, width, thicknesses or diameters)
Method of construction (mortared, drylaid, nailed, etc.)
Shaping of elements (presence or absence, estimated percentage of elements shaped)
Placement (horizontally and flat, set vertically, rubble core, no discernable pattern, etc.)

b. Hearths
Outline shape
Dimensions
Constructional materials
Placement of elements
Condition
By-product of hearth usage (absence or presence of charcoal stains, firecracked rock; if present, spatial dimensions and volume estimate of by-products)

c. Artifactual Debris (including ceramic fragments, lithic artifacts, industrially manufactured containers, etc.)
Areal extent of debris
General description of kinds and density of debris
Observations about possible behavioral determinants of deposition
Location of debris with respect to architectural features or other artifactual debris proveniences within site location.

PROVENIENCE DATA FORM

Site Field #__________ Provenience #___ Site LA #__________ Date____________

Recorder_____________ Photo #:B/W______________________Color_______________

Forms: Lithic___ Ceramic___ Historic___ Petroglyph___ Maps___

Provenience Description:

PROVENIENCE DATA FORM

Site Field #__________ Provenience #___ Site LA #__________ Date____________

Recorder_____________ Photo #: B/W____________________ Color_______________

Forms: Lithic___ Ceramic___ Historic___ Petroglyph___ Maps___

Provenience Description:

PROVENIENCE DATA FORM

Site Field #__________ Provenience #___ Site LA #_________ Date____________

Recorder_____________ Photo #:B/W________________________ Color_____________

Forms: Lithic___ Ceramic___ Historic___ Petroglyph___ Maps___

Provenience Description:

Figure V.2 Provenience Data Form

The provenience data form proved to be an economical format for recording architectural and artifactual information in terms of time investment and flexibility in the field. Space requirements for description, however, suggested that 2 rather than 3 proveniences should be placed on a single form.

3. Isolated Occurrence Form (Fig. V.3)

The isolated occurrence form was employed to describe the kind, physiographic situation and vegetative situation of isolated artifacts. The spatial location of these were plotted on USGS maps carried by each crew member. Description of physiographic and vegetative situation followed the format discussed for those categories on the site data form, and description of isolated occurrences themselves followed the format discussed for architectural and artifactual variability discussed for the provenience form.

4. Lithic Data Form (Fig. V.4)

The lithic data form was designed to monitor inter-provenience and intersite variability in material selection, manufacture and use of stone tools. The lithic data form was employed to document stone artifact variability for each provenience locale exhibiting distributions of stone artifacts. The strategy of documentation was to examine each artifact for the presence or absence of a finite set of attributes, and to then enter the artifact in the appropriate place in the attribute matrix. If a sample unit was employing to monitor variability at the provenience, the dimensions of the sample unit were entered under "Size of Sampling Unit" at the bottom of the form. If all artifactual variability at the provenience locale was monitored, "All Recorded" was checked. This kind of procedure permitted estimation of stone artifact densities for each

ISOLATED OCCURRENCE FORM
Field # ________ Kind ____________________ Date ______________ Photo # ______
Physiographic and Vegetative Situation:

Description: (Include quantity, areal extent, density and photo #'s)

ISOLATED OCCURRENCE FORM
Field # ________ Kind ____________________ Date ______________ Photo # ______
Physiographic and Vegetative Situation:

Description: (Include quantity, areal extent, density and photo #'s)

ISOLATED OCCURRENCE FORM
Field # ________ Kind ____________________ Date ______________ Photo # ______
Physiographic and Vegetative Situation:

Description: (Include quantity, areal extent, density and photo #'s)

Figure V.3 Isolated Occurrence Data Form

LITHIC DATA FORM Field #________ LA #__________ Provenience #__________

Recorder______________ Date__________ Project______________

MATERIAL	OBSID	BSALT	QTZIT	CHERT	CHALC	SNDST	OTHER		
Unrt. Debitage									
CORTEX									
No Plt									
Unprp Plt									
Prp Plt									
NO CORTEX									
No Plt									
Unprp Plt									
Prp Plt									
Ret. Debitage									
CORTEX									
No Plt									
Unprp Plt									
Prp Plt									
NO CORTEX									
No Plt									
Unprp Plt									
Prp Plt									
Uniface									
Biface									
Core									
Chopper									
Hammerstone									
Mano									
Metate									
Other									

Artifact Descriptions: Yes__ No__ (If Yes, use back of form)

Assemblage Observations: All Recorded__ Size of Sampling Unit________

Figure V.4 Lithic Data Form

provenience locale monitored.

The following discussion will briefly outline in definition form attribute variability monitored through use of the lithic data form.

a. Material

Seven material categories were monitored during the initial stages of survey. These included obsidian, basalt, chert, chalcedony, quartzite, sandstone and other. These materials were monitored "generically" in the sense that taxonomic subdivisions of material types were not uniformly employed throughout survey. It became apparent during survey that relevant sub-taxons of some materials, especially obsidians, cherts and chalcedonies, could be defined, and this was done for approximately 60% of the site locations.

b. Debitage Attributes

Debitage is defined as any piece of material detached from a core or another piece of debitage through the application of force. Cortex and platform variability was monitored only for pieces of debitage which were unretouched, or marginally retouched.

i) Retouch: A piece of debitage was considered to exhibit retouch if any portion of its perimeter had been altered through detachment of smaller pieces of debitage such that only the margins of the original artifact exhibited alteration. Retouch modification which had substantially altered the entire outline shape and/or one or both surfaces of the original artifact was classified as facial retouching, and the artifact was entered under the appropriate "Uniface" or "Biface" category on the lithic data form.

ii) Cortex: A piece of debitage was considered to exhibit cortex if any portion of its dorsal surface or platform exhibited

a remnant of the original cortical surface of the parent material from which the debitage was manufactured.

iii) Platforms: Three categories of debitage platform variability were monitored. If a piece of debitage did not exhibit a platform, it was monitored in the appropriate "No Plt" row in the data matrix. If a piece of debitage exhibited a platform characterized by a single facet indicative of it having been detached from an unmodified striking platform, it was entered in the appropriate "Unprp Plt" row of the data matrix. If a piece of debitage exhibited a platform indicative of it having been detached from a previously retouched edge margin of another larger piece of debitage, it was entered in the appropriate "Prp Plt" row of the data matrix. This latter platform taxon was monitored to differentiate pieces of debitage detached as preform thinning flakes or as by-products or resharpening previously retouched tools.

iv) Utilization: Although the lithic data form was not designed to account for debitage utilization, it became apparent during survey that gross evidence of utilization could be monitored in the field through examination with an 18x jeweler's loup. Utilization was thus monitored for approximately 60% of provenience locales through entering frequencies of utilized and unutilized artifacts within each taxon in the data matrix.

c. Unifaces and Bifaces

These artifacts were defined as pieces of debitage exhibiting retouch modification which substantially alters the entire outline shape and one or both surfaces of the original piece of debitage. If only one surface was modified by facial retouching, the artifact was classified as a "Uniface" and entered in the appropriate place in the data matrix. If both

surfaces were modified through facial retouching, the artifact was classified as a "Biface" and entered in the appropriate place in the data matrix. Both unifaces and bifaces were entered with letter codes, and drawn to actual size or to scale on the back of the lithic data form.

d. Cores

Cores were defined as pieces of material which exhibited large negative debitage scars originating from platform surfaces.

e. Choppers

Choppers were defined as artifacts which exhibit no bulb of percussion, no ventral surfaces, either bidirectional or unidirectional marginal retouching, and evidence of usage in the form of battering or step fracturing along some retouched portion of their edge perimeters.

f. Hammerstones

Hammerstones were defined as artifacts which exhibited battering as the only alteration of their surfaces.

g. Manos

Manos were defined as artifacts which exhibited facets or surfaces produced through grinding which were flat or convex both in longitudinal and latitudinal cross-section. Three categories of manos were recognized.

i) One-hand manos, defined by circular to oval outline shape and width/length ratios of .75 or greater.

ii) Two-hand manos, defined by rectangular outline shape and width/length ratios of less than .75.

iii) Indeterminate manos, defined as manos which could not be further differentiated into sub-taxons using the above criteria.

h. Metates

Metates were defined as artifacts which exhibited surfaces produced

through grinding which were slightly to highly concave in both longitudinal and latitudinal cross-section. Three sub-taxons of metates were monitored during survey.

i) Deep basin metates, characterized by highly concave grinding surfaces which were oval in outline and did not extend across the entire surface of the artifact.

ii) Shallow basin metates, characterized by very slightly concave grinding surfaces which were oval in outlin· ınd did not extend across the entire surface of the artifact.

iii) Indeterminate metates, defined as metate fragments which could not be assigned to either deep-basin or shallow-basin sub-taxons employing criteria defined above.

i. Other Artifacts

This row in the data matrix was reserved for classes of artifact variability not accounted for by named categories on the Lithic data form such as axes, mauls, beads, etc.

5. Ceramic Data Form (Fig. V.5) Prepared by A. H. Warren

a. Methodology

A two day training session on ceramics was conducted for members of the survey team prior the commencement of the field work. Since a "no-collection" policy was established, and the number of sherds at each site was expected to be minimal, efforts to obtain maximum information from the field data seemed essential.

Literature relating to pottery typology in the upper Middle and Upper Rio Grande region was reviewed, in order to obtain as complete a compilation of ceramic data as possible for both local and intrusive types that might be expected to occur in the White Rock Canyon.

CERAMIC DATA FORMS Field #__________ LA #__________ Provenience #__________

Project __________ Recorder__________ Date__________

POTTERY TYPE	Bowl	Olla	Other	Totals
Santa Fe B/W				
Galisteo B/W				
Wiyo B/W				
Abiquiu B/G				
Bandelier B/G				
Sankawi B/C				
Carbon/white				
Red Mesa B/W				
Kawahe'e B/W				
Mineral/white				
La Plata B/R				
St. Johns P.				
Heshota. P.				
Mineral/red				
Carbon/red				
Tewa Poly.				
Posugue Red				
Kapo Black				
Ogapoge Poly.				
Powhoge Poly.				
Carbon Poly.				
Lino Gray				
Corrugated				
Cor. Diag.				
Clapboard				
Ribbed				
Plain Incised				
Washboard				

POTTERY TYPE	Bowl	Olla	Other	Totals
Agua Fria G/R				
San Clemente G-P				
Cieneg. G/Y				
Cieneg. G-P				
Largo G/Y				
Largo G-P				
Espinoso G-P				
San Lazaro G-P				
Puaray G-P				
Kotyiti G-P				
Salinas Red				
Unid. G/R				
Unid. G/Y				
Unid. G-P				
Unid. red				
Unid. white				
Puname Poly				
Casitas R/B				
Red/tan				
Ashiwi Poly.				
Mineral Poly.				
Corona Plain				
Potsui' Inc.				
Plain smooth				
Plain striated				
Plain Mica Sl.				
Plain micaceous.				
Black IC				
Black IC mica.				
Polished Brown				

TOTALS__________

Assemblage Observations: All Recorded____ Size of Sampling Unit__________

Remarks:

Figure V.5 Ceramic Data Form

Pottery types were grouped by paint variety and surface color combinations, as these attributes are those most commonly used to distinguish ware in the Rio Grande. Established type names were used, but groupings did cut across ware boundaries in some cases, in order to include intrusive or trade pottery.

The distinguishing characteristics of each pottery type, as well as its time range, were listed. The attributes were kept to a minimum whereever possible, as only hand specimen analysis would be possible in the field. Division lines between pottery types are always arbitrary, but efforts were made to emphasize those attributes which could be observed in hand specimen and would reflect cultural, chronological or technological differences.

A survey form for ceramics, based upon the field classifications, was drawn up, including those types that would most likely occur and with room for write-in additions. Provision for indicating vessel form was also added. Utility wares could not be listed by pottery name, as many gaps still exist in classification, but descriptive terms were used, such as "plain incised," "clapboard," etc.

b. Description of Ceramic Types

Ceramic type descriptions are presented for those taxons which were expected to occur at site locations within the project area, and are summarized in Table V.1. This table lists type names, dates of manufacture, and a brief outline of distinguishing featues for each ceramic type. Abbreviations for design application are summarized below.

B/W = Black on White
B/G = Black on Gray
B/C = Black on Cream
B/R = Black on Red
R/B = Red on Buff
G/R = Glaze on Red
G/Y = Glaze on Yellow
G-P - Glaze Polychrome

TABLE V.1: CERAMICS - DISTINGUISHING FEATURES

Carbon Painted Wares

Santa Fe B/W	1175-1300	Fine textured, compact clay body; usually hard, brittle, gray. Fine grained temper, mostly glass shards and silt; may be slipped.
Gallina B/W	± 1250	Fine sandy texture. Designs usually narrow parallel lines.
Vallecitos B/W	?1200-1350?	White slip, polished interior only; sandstone, pumice temper.
McElmo B/W	?1075-1250	Polished, crackled surface, both sides; tapered to squared rim ± ticking; wide design bands, pendent lines: Sosi and Dogozshi styles; sherd, sandstone, igneous rock tempers.
Galisteo B/W	?1250-1350	Polished, often crackled surfaces, both sides; tapered to squared rims; designs Sosi, Dogozshi styles; pendent dots; checkerboards; sherd, local Rio Grande rock temper.
Jemez B/W	1300-1750	Slipped polished both sides; carbon paint has tendency to turn brown or red; crystal pumice temper in dark gray clay.
Wiyo B/W	1300-1400	Clay tan, gray, olive, soft, biscuity; polished, slipped inside (bowls only); designs solid black, "bold." Vitric tuff temper usually.
Abiquiu B/G (Biscuit A)	1350-1450	Polished interior; unpolished, unslipped exterior; pumice shard temper; fine to broad line, pendent dots, triangles, interior only, rims may be ticked. May be slipped. Gray clay.
Bandelier B/G (Biscuit B)	1425-1550	Polished both sides of bowl, may be slipped; pumice temper; designs as above, but on both sides of bowls. Gray clay.
Sankawi B/C	1500-1675?	Cream colored slip, tan clay; pumice shard temper; polished, dull surfaces; thin line designs; parallel lines framing dots common.

Table V.1 (Continued)

Mineral Painted Wares

White Mound B/W	675-900	Rough surfaced ± slip; chevrons; "Z"s, triangles characteristic designs; sandstone temper. Bowls hemispherical.
San Marcial B/W	600-850	Polished surfaces; white clay; red, brown, or black paint.
Kiatuthlanna B/W	825-900	Polished both sides; designs radial panels, checkerboard; crosses, zigzag lines; bowl form conical. Sandstone temper.
Red Mesa B/W	875-1050	Polished ± slip; sherd temper; designs pendent dots, triangles, scrolls, ticking, stepped elements, checkerboards, keys.
Cortez B/W	900-1000	As above, igneous rock, sandstone, or sherd temper.
Puerco B/W	1010-1125	Polished ± slip; Sosi style design, broad line geometric.
Mancos B/W	950-1150	Polished ± slip; designs solids repeated, hatching (Dogozshi); black, greenish, or tan paint; conical bowl forms. Temper like Cortez B/W.
Socorro B/W	1050-1275	Fine hatched designs; gray indurated clay; sherd temper; (solid Sosi style may be Puerco or Cebolleta).
Kwahe'e B/W	950-1225	Polished interior ± slip; grayish brown clay, indurated; sherd, temper, Sosi, Dogozshi, other design styles.

Glaze Pottery

Group A: Characterized by direct parallel-sided rims; crushed sherd or rock temper; glaze paint; bowls, ollas.

Agua Fria G/R	1315-1425	Red surfaces inside and out; design simple geometric, encircling bands.
Arenal G-P	1315-1425	As above but with fine white line design on exterior.
San Clemente G-P	1315-1425	One surface of bowls red, the other white or tan.
Cieneguilla G-P	1315-1425	White, yellow, tan, cream, or pink surfaces.

Table V.1 (Continued)

Cieneguilla G-P	1315-1425	As above but with glaze outlined red matte design elements.
Group B: Thickened, expanded lip or rim; crushed rock temper.		
Largo G/Y	1400-1450	Cream or white slip both sides; rarely pink.
Largo G-P	1400-1450	Glaze outlined red matte designs; rarely has red surface(s).
Group C: Short everted or beveled rims. Cream, white, pink or red surfaces, may be mixed. Glaze outlined red matte designs.		
Espinoso G-P	1425-1490	As above. Red matte designs mainly on bowl interiors; olla exteriors.
Pottery Mound G-P	1400-1490	Orange surfaces with glaze outlines red matte designs.
Kuaua G-P	1425-1490	Sharply everted rims; interiors of bowls not decorated.
Group D: Long thickened rims, often everted; may have interior carina. Glaze outlined red matte designs on both sides usually.		
San Lazaro G-P	1490-1515	Pink, orange, red, white surfaces, often mixed. Tapered rims.
Group E: Long thickened rims with exterior carina; or thick short rims with inward curve. Glaze outlined red matte designs.		
Puaray G-P (early)	1515-1600	Orange, red, white surfaces, may be mixed; rims may be beveled to exterior. Overall good workmanship.
Puaray G-P (late)	1600-1650	Runny glazes, streaky slips.
Pecos G-P	1600-1700	White slips, short, thick rims; sandstone temper. May have red surface(s).
Group F: Long, parallel sided rims, with exterior carina at base. Duochromes more common than in earlier group. Runny glaze paints.		
Kotyiti G-P, G/Y, G/R	1650-1700	Includes carinated bowls, ollas with sharply everted rims; shouldered bowls; soup plate forms, pitchers.
Salinas Red	1650-1700	Polished redware; forms and temper similar to Kotyiti glaze types.

Table V.1 (Continued)

	Black on Red Pottery	
La Plata B/R	800-1000	Red slip smoothed and polished; well executed, medium-line geometric designs; igneous rock temper (with hornblends).
Puerco B/R	1000-1200	Slipped and polished; solid line designs; Sosi style. Sherd temper.
Wingate B/R	1050-1200	Hatching, scrolls, Dogozshi or Tularosa style; sherd temper.
St. Johns Polychrome	1175-1300	Hatching, scrolls, Tularosa style; exterior has broad white line designs; sherd temper.
Heshotauthla Polychrome	1300-1375	Black glaze interior designs; fine white line design exterior. Sherd temper; rims rounded, beveled.
"Tewa" B/R	1680-?	Black carbon paint on red or pink surfaces; forms like associated historic vessels; temper varied.
	Historic Carbon Paint Pottery	
Tewa Polychrome	1675-1720	Fine line designs on polished white ships; red underbody; carinated bowls; vitric tuff temper; also crystal pumice.
Posuge Red	?1675-?	No designs; well polished; vitric tuff temper; also sandstone.
Kapo Black	?1650-?	Polished gray or black surfaces; vitric tuff, sandstone temper (red slipped, then smudged).
Potsui'i Incised	?1450-1550	Geometric fine line incised designs, on smoothed tan surfaces; may have mica slip; vitric tuff temper.
Ogapoge Polychrome	1720-1800+	Carinated bowls, ollas ± red matte designs; vitric tuff, crystal pumice temper.
Powhoge Polychrome	1760-1900?	No carinas, red rims early, black rims late; vitric tuff, crystal pumice temper.
	Historic Mineral Painted Pottery	
Puname Polychrome	1680-1780 +	Carinated bowls; jars; red, black paint; basalt, crystal pumice temper. Post-1780, rounded forms.

Table V.1 (Continued)

Gobernador Polychrome	?1690-1775?	Carinated bowls; dense, hard tan clay; unframed red paint designs. Temper varies, siltstone to sherd.
Casitas R/B	1740-1900?	Broad red line designs on polished buff surfaces; temper crystal pumice, sandstone, etc., coarse grained.
Red on Tan, Misc.	?1750-?	Red line designs on buff surfaces, chevrons, slashes, narrower lines than above.
Ashiwi Polychrome	1700-1770	Acoma or Zuni; feather symbol designs; sherd temper.
Hopi pottery		Dense, yellow, often untempered, hard clay body. San Bernardo (1600-1750) has crude black and red painted designs.

6. <u>Historic Artifact Data Form</u> (Fig. V.6) Prepared by Emily K. Abbink and John R. Stein

a. <u>Introduction</u>

The historic field data form was designed specifically to monitor massproduced commercial items. These begin to appear in the Southwest in abundance during the last quarter of the 19th century, as a result of continually increasing articulation of New Mexico populations with the industrial economy of the United States. These items were first transported into New Mexico via the Santa Fe Trail in the 1820's, although at this early date Eastern goods were not generally available to the rural population. Increasing frequencies of these goods subsequently arrived in the region, and were broadly distributed as a result of military operations in the 1840's and 60's and most importantly, through the arrival of the railroads in the 1880's.

With the railroads came the immediate expansion of Anglo influence, and corresponding social, economic, and technological changes, in what was formerly a remote and isolated region. Commercial products, particularly those arriving by rail in the 1880's were designed to be inexpensive and widely available. They were quickly utilized by all cultural groups in the Southwest, and in many cases, replaced native crafts and chores.

An example of this trend is illustrated through the abrupt change in native ceramic industries caused by the introduction of enamelwares, which were cheap, durable, lightweight and easily cleaned.

Of the massproduced items which occur in the archeological record, containers, both of glass and metal, are possibly the most sensitive to technological and economic change. Collectively, they have high information potential for temporal and functional considerations of site usage, and are oftentimes the most common and durable artifact found on recent archeological

Project: Field # LA # Provenience # Recorder:

CONTAINERS	Container Type & Apparent Contents	Glass Color	Closure: crown cap	Closure: screw	Closure: cork	Closure: other	seam over closure	reuse	volume oz.	Labels: silk screen	Labels: paper	Embossed	Date (lab use only)	photo #

CANS	Container Type & Apparent Contents	Opening Procedure: replacable lid	Opening Procedure: pop top	Opening Procedure: key	Opening Procedure: knife	Opening Procedure: twist	Opening Procedure: other	volume oz.	Seams: soldered	Seams: crimped	Material: aluminum	Material: steel	Labels: silk scrn.	Labels: paper	reuse	embossing	Label Emboss.	Container Shape	Date (lab only)	photo #

Figure V.6 Historic Artifact Data Form

Describe and discuss the following:

Nails:

Cartridges:

Enamelware:

Plastics:

Barbwire:

Lumber:

Reuse (secondary)

Misc. Other

Figure V.6 Historic Artifact Data Form

sites. Containers are designed to be convenient and disposable, in many instances "advertise" their contents, and are of limited utility once their contents are consumed. Hence, they are rarely curated for any length of time and are usually discarded on the spot.

b. Methodology

The historic data form stresses the recording of glass and metal container attributes because of their high information potential, resulting from the general abundance of containers, the immediate nature of their disposal, the persistence of forms dictated by contents, the availability of documentation. The form was designed to facilitate the preliminary analysis of relevant container attributes in the field, for the derivation of temporal and functional information. In addition, the reverse side of the form was reserved for comment on container variability not monitored by the form, and for documentation of commonly found, though less informative items of material culture. Field personnel attended a brief training session to familiarize themselves with the use of the form and examples of historic materials.

The following is a list and short description of those categories included on the form.

c. Attribute Variability: Glass Containers

1) Container Type: The late 19th and early 20th centuries saw thousands of new products introduced to the general public. Many of these items were packaged in glass containers of characteristic shape rather than with labels because many customers could not read. Some of these functionally dictated container shapes, including beer, soda pop, milk, ketchup and mustard among others, persist to the present day. In addition to functional information concerning content, container shapes can be used for dating

purposes. Canning jars were first manufactured in 1810, beer was first bottled in 1873, soda pop and milk in the 1880's and mentholatum in 1889.

2) <u>Color</u>: Color of glass is determined by mineral additives. The natural color of glass is a pale greenish brown, and throughout the history of glass container manufacture different additives were employed to change that natural color. The following colors can be employed to date periods of glass manufactured:

Black glass (actually a very dark green): 1815-1885

Purple or amethyst: ca. 1880-1917

Aqua: 1880-1920

Honey (very pale brown): 1914-ca. 1930's

Dark brown (amber): 1873-present

Opalescence ('sick glass'): ?-1930's

Perfectly clear: 1930-present

3) <u>Closures</u>: Variation in closures reflect many turn of the century attempts to develop airtight, inexpensive jet sanitary seals for glass containers. Although hundreds of closures were experimentally produced, only a few of these proved successful and were marketed for any length of time. The most common of these closures are monitored on the Historic Artifact Data Form:

Crown Cap (beer and soda pop): 1892-present

Screw (shallow ½ turn): 1919-present

Cork:

Sheared Lip: Pre-1850's

Crude Lip: 1840's-1860's

Smooth Lip: 1860's-1913

Additional space is provided for less common closures, such as the

Deep Screw for mason jars (post 1858) or the glass ball stopper for soda pop (1870's).

4) Seams: The presence or absence of finish or closure seams can often date a bottle before or after the introduction of automatic bottle molds (1903). When seams are present, technological improvements and thus dates may be monitored by observing where the seams stop. The automatic bottle machine of 1903 soon replaced all other methods of commercial manufacture. Seam dating is thus a good guideline for only 19th century bottles because almost all 20th century bottles will display a continuous seam over the closure. Only the presence or absence of a seam over the closure is monitored by the form. Bottles exhibiting no seam over the closure but body seams can be relatively dated from the 1850's to 1903 by noting how far up the neck of the bottle seams continue. Bottles exhibiting no body seams are either free blown (pre 1830's) or molded but turned in the mold so that seams are obliterated (1860's). Bottle bases exhibiting pontil scars indicate a pre-1860 date of manufacture, while bases exhibiting ring seams indicate manufacture by automatic bottle machines (1902-present).

5) Reuse: Reuse of broken glass containers is noted to provide functional information about the cycling of the containers as technological material resources. The form provides space to check presence or absence of wear patterns or retouching indicative of usage. The back of the form can be employed to describe such usage in detail.

6) Volume: Volume is important for helping to date 20th century soda pop bottles. The majority of bottled soft drinks were sold by machine until recently, and had to conform to certain weights and measurements to correspond with machine dimensions. The 6 ounce size was introduced some time after 1907; 8 and 10 ounce sizes were popularized in 1924, and 12 ounce

sizes were introduced in 1934.

7) Labels and Embossing: Labels and embossing provide information about contents, brand names or manufacturing plants which if recorded in detail can be used to refine general dates indicated by attributes of manufacture. Paper labels have been used throughout the history of glass container manufacture, while silkscreened labels were introduced in the 1920's and 1930's for many products. Embossing become popular with the introduction of iron molds for bottle manufacture in the mid 19th century. Space is provided for checking the kind of labels exhibited, and for recording information contained in labels or embossing.

d. Attribute Variability: Metal Containers

Information concerning kinds and dates of changes in the technology of can manufacture is often conflicting, and not well documented in general. The following summary presents some attribute variability which can be employed for dating purposes.

1) Container Type: Container types provide primarily functional data concerning contents, and in some cases can be used for dating. Tapered meat cans were first marketed in 1875, Log Cabin Syrup cans shaped like cabins were marketed between 1887 to the 1940's. Tuna was first canned in 1907, and motor oil in the 1930's. Other products canned in characteristic shapes of containers include coffee, cigarettes, tobacco, sardines, and baking powder.

2) Opening Procedure: Opening procedures reflect much technological change through time and often aid in dating time of manufacture or use of contents. Opening procedures fall into two categories, those which involve use of a tool, and thus leave characteristic patterns of opening; and those which do not require a tool for opening.

Replaceable Lids: Replaceable lids usually indicate dry contents such as baking powder or coffee, and date in manufacture after ca. 1920.

Pop-tops: Pop-top openings were introduced in the early 1960's.

Key-opened: Keys which wind up precut metal strips on can containing such products as corned beef were introduced in the 1890's.

Knife-opened: Use of knives to open cans is common throughout the history of can use, and thus provides little datable information. Patterns of knife opening can, however, suggest container contents.

Bayonet: (not on form) Bayonet type openers were introduced ca. 1858.

Twist: Twist type rotating gear openers were introduced in 1925.

"Church Key": (not on form) Punch or "church key" openers for beverage containers were first marketed during the 1930's.

3) Volume: Volume may be embossed or silkscreened onto cans, and provide potential information concerning dates of manufacture.

4) Seams: Early cans were manufactured by hand with heavily soldered seams. Machine soldered cans were manufactured beginning in 1880 and are characterized by a more sparing use of solder and more even application. The shift from soldered to double crimped unsoldered seams is not well documented, but appears to have taken place sometime ca. 1900 in most cases.

5) Material: Aluminum is a latecomer to the canning industry and has been used largely for beverage containers since the mid 1960's. Inside-coated or laquered cans were first used in the U.S. in 1890. Cans for dry foods such as coffee and non-food products such as paint or oil may be manufactured from tinless steel plate.

6) Labels: Labels, whether embossed, silkscreened or paper, are

probably the best single attribute for yielding both functional and temporal information. The first off-set press to print on metal was invented in 1875, using two colors at first, and up to four colors by the 1940's. Silkscreen methods for labeling cans have been employed since 1907. Paper labels are ubiquitous throughout the history of canning, while embossing seems to have been confined to the replaceable lids of early dry foods and non-food items.

7) Reuse: Reuse is monitored in an attempt to document the utilization of cans as technological materials. Can reuse often involves modification of the container for utilization as a cup, strainer or cutting tool. Room is provided on the reverse side of the form for description of reuse.

e. Other Historic Artifacts

The reverse side of the Historic Artifact Data Form was designed to monitor in general fashion some classes of artifacts for which information has been established, with blank spaces for additional listings and comment.

1) Nails: Nails may be dated if the method of manufacture (hand-forged, square-cut, drawn wire) is noted.

2) Cartridges: Cartridge cases can often be dated if the exact notation of embossing and caliber is made.

3) Enamelware: Cast iron pots were first enameled in 1874, and by 1890 fabricated seamed utensils and seamless deep-drawn items were enameled. These first enamelwares (pre-1920's) were often called "Agatewares" and were usually a drab grey on grey or blue color. Around 1920, white and many bright colors became popular. Cast iron pots were made as early as 1642, tinware as early as 1720, porcelain enameled pots in 1874, stamped and cast aluminum in 1892, stainless steel in 1927, chrome plate in 1933, pyrex glass in 1915, and copper bottomed utensils (Revere Ware) in 1937.

4) Plastics: Some kinds of plastic items have been marketed beginning in 1872, but extensive use of plastics for commercial production of many disposable items including containers did not begin until after World War II. The following list presents beginning dates of manufacture of some plastic items.

1909: knobs

1919: buttons

1920: caps for squeeze tubes

1927: combs

1940's: food storage containers

1946: dishes

early 1950's: squeeze bottles, and a variety of other bottles.

5) Barbwire: Barbwire can be dated if illustrated properly.

6) Lumber: Approximate dates can be assigned to lumber on a regional basis if it is noted as milled, rough-sawn, etc.

7) Other: This category is employed to record any items not otherwise accounted for on the form. A variety of items can be dated if properly described, including buttons, automobile parts, toys, etc. Tinker Toys were first manufactured in 1914, Ideal Toys (brand name) in 1902, and Mattel Toys (brand name) in 1945, for example.

7. Pictograph and Petroglyph Data Form (Fig. V.7)

This data form was designed to monitor variability in condition, technique and design of painted or pecked, scratched and incised designs found on boulders, shelters or cliff faces. The form is largely self-explanatory. Black and white photos were taken of each occurrence of petroglyphs and pictographs.

PICTOGRAPH AND PETROGLYPH RECORD SHEET
OFFICE OF CONTRACT ARCHEOLOGY
UNIVERSITY OF NEW MEXICO

SITE NO.: ____________________ PROJECT: ____________________

RECORDER: ______________________________ DATE: ______________

CONDITION: Undisturbed ____
Vandalized ____
Slightly Weathered ____
Heavily Weathered ____

TECHNIQUE: Incised ____
Pecked ____
Painted ____
Combination ____

ASSOCIATED CULTURAL REMAINS: yes ____ no ____ Other ______________

PHOTOGRAPHS: B/W____ Color____ ADDITIONAL DRAWINGS/RUBBINGS: yes___no___

DESCRIPTION OF EXAMPLES OR PANEL DRAWN: ______________________________

SKETCH OF PANEL ___ MAJOR ELEMENTS ___ OR GRAFITTI ___ (SCALE_________)

Figure V.7 Pictograph and Petroglyph Data Form

D. Summary of Cultural Resources Within the Cochiti Reservoir Permanent Pool

Descriptions of each site location within the permanent pool project area are presented in Appendix B, and site variability is summarized by temporal component in Tables VI.1 through VI.10. A total of 103 archeological site locations were documented during survey, 12 of which had been previously reported. This discussion will briefly summarize variability among site locations by temporal component.

1. Lithic and Lithic/Ceramic "Open" Sites (Tables VI.1-4)

A total of 30 site locations characterized by scatters of lithic or lithic and ceramic artifactual debris and no architectural structures were documented within the permanent pool. Twenty-two of these site locations exhibited hearths, or evidence of hearth usage in the form of firecracked rock scatters (Tables VI.1, 2). Of these, nine exhibited between one and 15 ceramic fragments, while the remainder exhibited no ceramic fragments. Of those exhibiting ceramics, one dated to the P-III phase, six dated to the P-IV phase, and two could not be assigned to temporal phase.

A total of eight site locations exhibited no evidence of hearth construction or usage (Tables VI.3, 4). Three of these sites exhibited one ceramic fragment, a fourth exhibited two ceramic fragments, and the remaining four exhibited only lithic artifacts. Of those sites exhibiting ceramic fragments, one dated to the P-III phase, one dated to the P-IV phase, and two could not be assigned to temporal phase.

Lithic artifacts from several site locations suggested their deposition during latter periods of Archaic adaptation to the region (ca. 800 B.C. - A.D. 400), and subsequent reuse of some site locations during one or more periods of Anasazi adaptation (ca. A.D. 600 - A.D. 1600). No artifacts

diagnostic of PaleoIndian or early periods of Archaic adaptation were observed at these site locations.

2. Anasazi Period Structural Site Locations

A total of 28 site locations exhibiting Anasazi components and architectural structures were documented during permanent pool survey. Five of these site locations had been recorded during previous surveys. All but four of these site locations were single component sites. Seven of the site locations were assigned to the Anasazi period of adaptation primarily because of architectural variability, and could not be dated to phase. Of these sites, four were 1-room structures; one was a 2-room structure, and two were 3-room structures (Table VI.8).

The remaining 22 site locations could be assigned to temporal phases based upon taxons of ceramic fragments. One of these site locations (LA 12452) exhibited two spatially distinct structures in association with lithic and ceramic debris which dated to different temporal phases. The following summary will treat both these components in their respective temporal phases.

BM-III, P-I and P-II phases:

No components dating to these phases were documented.

P-III phase: (Table VI.5)

Three site locations exhibiting a total of 26 rooms were documented. One site location exhibited two rooms, one exhibited three rooms, and one exhibited 21 rooms.

P-III/P-IV Multicomponent phase: (Table VI.5)

One site location exhibiting a single pithouse or kiva depression, and a single rubble mound comprised of an estimated two rooms was recorded.

P-IV phase: (Table VI.6)

Fourteen site locations exhibiting a total of 19 rooms were documented. Ten sites exhibited a single room each; three sites exhibited two rooms each, and one site location exhibited a 3-room structure. One site location was situated amidst a set of agricultural terraces.

P-IV/P-V Multicomponent phase: (Table VI.7)

Two site locations exhibiting a single room each dated to this phase.

P-V phase: (Table VI.8)

Two site locations dated to this phase. One exhibited a two-room structure, and the other exhibited three non-contiguous rooms.

3. Historic Period Site Locations (Table VI.9)

A total of 44 site locations characterized by one or more Historic components were documented during survey of the Permanent Pool, eight of which has been previously recorded. Table VI.9 summarizes Historic period component variability by site location and temporal phase.

It should be noted that two site locations, LA 70 and LA 6178, although summarized in Table VI.9 are not described in Appendix B. Both these sites are situated within the project area, but were excavated by the Museum of New Mexico in conjunction with the Cochiti Dam Salvage Project, and are described in detail in Snow (1973b), Peckham (1966), and Warren (n.d.). A third site, LA 591, was also excavated by the Museum of New Mexico, and descriptions found in Appendix B are derived from Snow (1973a). LA 9139 was tested by the Museum of New Mexico, but descriptions of the site location found in Appendix B are based upon Cochiti Reservoir permanent pool survey data.

Colonization phase (A.D. 1598 - A.D. 1680)

Two site locations exhibit components dating to the

Colonization phase. One of these sites, (LA 591), is a single component hacienda comprised of an "L"-shaped structure of three contiguous rooms, and associated extensive corral structures. The nature of the Colonization phase component at the other site location (LA 6178) is uncertain. Both site locations have been previously excavated by the Museum of New Mexico.

Colonial phase (A.D. 1692 - A.D. 1821)

Eight site locations exhibit components dating to this phase. One of these is comprised of a single 2-room structure, while the two are single room structures. A fourth site is comprised of four structures containing a total of seven rooms. Corral walls are associated with this site location (LA 9138) as well. Two site locations exhibit walls and extensive masonry corrals, but no definable habitation structures. Another site, LA 6178, is a large presidio exhibiting two towers. The Colonial phase occupation of LA 70 is uncertain.

Mexican phase (A.D. 1821 - A.D. 1847)

No site locations could be definitely assigned to this phase.

Territorial phase (A.D. 1846 - A.D. 1912)

Seven site locations exhibited Territorial phase components. Three of these were single room sites, one of which exhibited a small brush corral. One site location exhibited three non-contiguous single room structures, and eight masonry pens or small corrals. One site location was a pumphouse built at the river's edge which contained a large internal combustion engine. A metal pipeline led from the pumphouse to the mesa top behind the site. Another site location was characterized by an area leveled by blasting directly adjacent to the river, and several sections of metal pipe but no structures. It is presumed that this location represents a construction site for a pumphouse which was not completed. The seventh

site location has been documented as the trash dump for "Boom," a seasonally occupied camp at a railhead where railroad ties boomed down White Rock Canyon were loaded onto cars for rail transportation.

New Mexico Statehood phase: Pre-WWII (A.D. 1912 - A.D. 1941)

Two site locations date to this phase, one of which is a trash scatter, and the other of which is comprised of a single room masonry structure.

Modern phase: (A.D. 1941 - present)

Eleven sites exhibited components dating to the post-WWII phase. All of these were temporary campsites, nine of which were comprised of one or more hearths situated within 20 meters of the river's edge. Two of the site locations were deposited as a function of Museum of New Mexico excavations of LA 70 and LA 9139 in 1964 and 1965.

Historic Unknown phase: (Table VI.9)

A total of 16 site locations exhibited components which date to unknown phases of the Historic period. In some cases, these components exhibited one or more artifacts of industrial manufacture which could not be definitely dated, and in some cases the components were assigned to the Historic period based upon architectural style of construction.

Four of these site locations were comprised of masonry corral structures, eight were comprised of single room masonry structures, one was comprised of a single 2-room structure, and one was comprised of four non-contiguous single room structures. Two additional site locations were comprised of short masonry walls, one of which was found in association with a petroglyph.

4. Site Locations of Unknown Period or Phase (Table VI.10)

A total of six site locations could not be assigned to period or phase of deposition. Four of these were comprised of single room masonry structures,

one of which exhibited a hearth in association. A fifth site location was comprised of a depression suggestive of a sub-surface structure, but no associated artifactual or rubble debris. The sixth site location was comprised of two possible hearths which appeared of greater antiquity than the "modern" hearths encountered during survey, and no associated artifactual debris.

5. Isolated Occurrences (Table VI.11)

A total of 41 isolated occurrences were documented during survey of the permanent pool. These range from single artifacts, cairns, petroglyphs or hearths to low-count, low-density scatters of artifactual debris over broad areas of landscape. Variability among isolated occurrences is summarized in Table VI.11.

VI. Significance of Cultural Resources in Permanent Pool of Cochiti Reservoir

A. Introduction to Significance

The purpose of this section is to provide an assessment of the significance of the cultural resources directly impacted by the permanent pool of Cochiti Reservoir. This is in compliance with the intent of Section 106 of the National Historic Preservation Act of 1966, Section 102 2(c) of the National Environmental Policy Act of 1969, Section 2(b) of Executive Order 11593, Advisory Council on Historic Preservation Procedures for the Protection of Historic and Cultural Properties (36 G.F.R. Part 800), and Council on Environmental Quality Guidelines for the Preparation of Environmental Impact Statements (40 C.F.R. Part 1500).

Archeological significance may be assessed in historical, scientific, monetary and/or social terms (Scovill, Gordon and Anderson 1972:13). This section will focus on defining the historical and scientific significance of the impacted resources with the intent of evaluating those resources which may warrant recommendation to the National Register of Historic Places. Such an evaluation of significance will be based on the information potential the affected cultural resources may provide with respect to the problems outlined in the research perspective (see Section II).

B. Foraging Adaptive Systems

Direct archeological evidence of the operation of foraging systems of adaptation (or systems based on the procurement of nondomesticated floral and faunal resources) within the study area are at present limited in nature. Several reasons account for this relative lack of documentation and stem largely from the ephemeral nature of the material remains generated as by-products of foraging activities. Although foraging activities occur to

some extent in all human adaptive systems, the most prominent examples of foraging systems date to the PaleoIndian and Archaic Periods. These systems were solely dependent upon the procurement of nondomesticated floral and faunal resources for subsistence.

Models for the Archaic systems of adaptation in the Middle Rio Grande, for example, suggested that these systems focused on the procurement of seasonally available flora and fauna. This adaptive strategy or set of strategies necessitated relatively high mobility and did not result in substantial investment into construction of permanent habitation and storage facilities at any one site location. Specific sites were not inhabited for long periods of time during any single year and might or might not be revisited in successive years. Food resources were not stored for long periods of time and the transportation and consumption of food resources did not necessitate the use of ceramic vessels. The archeologically observable byproducts of Archaic adaptive behavior were largely surficial and rarely exhibited architectural remains other than occasional hearth areas. Rather, they were characterized by diversity in size, distribution and density of lithic artifactual debris.

Food resource procurement strategies directed toward nonagricultural floral and faunal species are not unique to Archaic foraging adaptive systems. Such procurement strategies have been documented as providing critical buffering resources for sedentary agriculturalists (Bohrer 1970), and direct evidence of the dietary importance of nonagricultural foodstuffs to prehistoric human populations engaged in intensive agriculture within the study area can be found in Lange (1968).

Focalized procurement strategies, especially procurement of floral foodstuffs such as seed collection of pinyon nut gathering, can be expected

to involve a narrow set of parameters conditioning site location selection and technology of acquisition regardless of their integration into predominantly foraging or predominantly agriculturally based adaptive systems. Material remains deposited at particular site locations employed as short term bases of operation for such procurement activities would be expected to exhibit very little variability indicative of their systemic context of deposition. Attributing such site locations to the operation of an Archaic foraging adaptive system or to one or more successive sedentary agricultural systems of adaptation is extremely difficult without recourse to sophisticated techniques of relative or absolute dating such as radio-carbon archeomagnetic, or obsidian hydration. Taxonomies of projectile point morphology can be employed with some degree of assurance in this regard, but the behavioral contexts conditioning manufacture, use and discardment of projectile points or fragments thereof mitigate against their occurrence at a majority of these seasonal foraging site locations.

It is thus substantially impossible to designate a finite set of site locations exhibiting material characteristics such as those discussed above as "definitely Archaic" or "definitely Anasazi" loci of procurement and/or consumption activities. For this reason, site locations characterized by an absence of architectural features (excluding hearths) and an absence of industrially manufactured artifacts (tin cans, glass, etc.) will be assessed for their significance according to the information they potentially provide about the operation of foraging adaptive systems within the study area.

Previous archeological documentation of site locations possibly attributable to Archaic adaptive behavior within the study areas has been largely restricted to survey data reported by Flynn and Judge (1973) and Snow (1970, 1973a). Only one of these possible Archaic site locations has

been intensively analyzed (Snow 1973c). This previous work had resulted in documentation of 81 site locations characterized largely by surficial scatters of debitage, with occasional occurrences of hearths, firecracked rock, manos, metates and ceramic fragments. Intensive survey of the Cochiti Reservoir permanent pool conducted for this assessment located an additional 30 site locations of this nature.

The presently known distribution of possible Archaic site locations within the study area is largely restricted to south of the Rio Chiquito on the west side of the Rio Grande, south of about the same latitude on the east side of the river, and within White Rock Canyon proper downstream from Alamo Canyon.

This distribution is confined to two vegetative communities, the juniper and juniper grassland. Given the assessment of previous archeological research elsewhere in the study area (Section IV) no statement can be made at present concerning the possible distribution of similar sites north of the presently known distribution, although their occurrence can be expected given many models of Archaic adaptive behavior.

Detailed information concerning artifactual assemblages, kinds of hearth construction, etc., is generally not available from previously documented sites. Comparison of these with similar site locations found within White Rock Canyon suggests that the latter do, however, reflect the range of variability previously documented for such sites. Variability exhibited among open site locations is summarized in Tables VI.1 - 4. More detailed descriptions of each site location can be found in Appendix B, and are located on the survey map enclosed in the pocket at the end of the report.

Very few site locations exhibited projectile points or projectile point fragments which could be used to infer relative dates of deposition.

TABLE VI.1

Permanent Pool Survey
Open Sites With Hearths and no Ceramics

Ceramic Phase	Site #	Hearths +	Hearths #	Provenience #	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	% Utilized Debitage	Lithics #	Sample Unit Size Meter^2	Artifacts per Meter^2	Milling Implements	Cores
	12436	+	ND	1	3750	Terrace	SW	0	38%	23	2.0	11.500	+	1
	12444	+	3	1	2475	Dune	N	0	7%	34	18.0	1.889	-	0
	12445	+	2	1	731	Bench	SW	0	45%	23	731.0	0.031	+	0
	12455	+	2	2	532	Bench	SW	0	28%	23	140.0	0.164	-	1
	12456	+	3	4	1575	Dune	SW	0	62%	29	27.0	1.074	-	2
	12459	+	1	1	21	Talus	W	0	8%	16	21.0	0.762	+	0
	12460	+	5	5	7000	Bench	W	0	23%	28	259.0	0.108	+	1
	12463	+	1	1	1200	Dune	S	0	6%	20	12.0	1.667	-	1
	12494	+	ND	1	1248	Dune	SW	0	12%	38	9.0	4.222	-	0
	12495	+	ND	1	150	Dune	SW	0	33%	25	9.0	2.778	+	3
	12499	+	ND	2	2400	Bench, Base of talus	SE	0	32%	25	8.0	3.125	-	0
	12502	+	ND	1	1750	Bench	S	0	ND	11	1750.0	0.006	-	0
	12521	+	ND	2	1800	Dune	E	0	30%	11	9.0	1.222	+	0

TABLE VI.2

Permanent Pool Survey
Open Sites With Hearths and Ceramics

Ceramic Phase	Site #	Hearths +	Hearths #	Provenience #	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	% Utilized Debitage	Lithics #	Sample Unit Size Meter^2	Artifacts per Meter^2	Milling Implements	Cores
Unknown	12481	+	2	3	1800	Base of talus	E	1	ND	103	890.0	0.116	+	6
Unknown	12490	+	ND	1	98	Bench	SE	2	ND	17	98.0	0.173	-	1
P-III	12496	+	ND	1	1800	Bench	SW	3	18%	32	9.0	3.556	-	1
P-IV	12439	+	6	1	2600	Bench	SW	1	12%	25	9.0	2.778	-	0
P-IV	12446	+	1	1	144	Terrace	N	4	75%	10	144.0	0.069	-	2
P-IV	12448	+	2	3	1800	Bench	NW	2	31%	32	4.0	8.000	+	2
P-IV	12482	+	4	1	1150	Base of talus	E	8	ND	38	1150.0	0.033	+	1
P-IV	12483	+	1	1	230	Dune	SE	15	ND	17	230.0	0.074	-	1
P-IV	12486	+	ND	1	130	Dune	S	4	ND	37	130.0	0.285	+	1

TABLE VI.3

Permanent Pool Survey
Open Sites With no Hearths and no Ceramics

Ceramic Phase	Site #	Hearths +	Hearths #	Provenience #	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	% Utilized Debitage	Lithics #	Sample Unit Size Meter^2	Artifacts per Meter^2	Milling Implements	Cores
	12442	0		1	2805	Terrace	SW	0	71%	34	18.0	1.889	-	0
	12450	0		1	25	Base of talus	SW	0	33%	12	25.0	0.480	-	0
	12457	0		2	16	Talus overhang	W	0	100%	2	16.0	0.125	+	0
	12468	0		2	800	Bench	NW	0	10%	30	50.0	0.600	+	2

TABLE VI.4

Permanent Pool Survey
Open Sites With no Hearths and With Ceramics

Ceramic Phase	Site #	Hearths + #	Provenience #	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	% Utilized Debitage	Lithics #	Sample Unit Size Meter^2	Artifacts per Meter^2	Milling Implements	Cores
Unknown	12479	0	1	400	Dune	E	1	ND	18	400.0	0.045	-	0
Unknown	12503	0	1	200	Base of talus	NE	1	ND	21	200.0	0.105	+	0
P-III	12478	0	1	126	Talus	SE	2	ND	13	126.0	0.103	+	2
P-IV	12491	0	2	36	Bench, Base of talus	S	1	ND	12	36.0	0.333	-	0

The few points documented are either similar morphologically to those described by Irwin-Williams (1973) as being characteristic of the En Medio Phase of Archaic adaptation, dating between 800 B.C. and A.D. 400, or are similar in morphology to later Anasazi projectile point types.

Of the 30 sites located, 22 exhibited evidence in the form of firecracked rock as having been loci of consumption activities. Nine of these exhibited ceramic fragments, although in low frequencies. Considerable diversity in site area size and density of artifactual debris was exhibited among site locations exhibiting hearths. Site sizes ranged from 21 m^2 to 7000 m^2, while artifact densities ranged between .006 and 11.5 artifacts per square meter (Tables VI.1, 2). Much of this diversity is attributable to patterned differences in utilization of site space, which seems in part conditioned by physiographic situation of site location. In those areas where rather substantial expanses of land area exhibit similar slope and exposure, hearth areas characterized by firecracked rock distributions tend to be discretely distributed several meters apart. Artifactual debris is distributed in greater densities around hearth areas, and in lower densities between hearth areas. Overall site sizes in these cases are considerably larger than are sizes of sites situated in physiographic contexts characterized by restricted expanses of land area exhibiting similar slope and exposure. In these cases, hearth areas tend to be clustered more tightly in space. Artifact density measures obtained during survey suggest, however, that behavioral rather than physiographic parameters are conditioning the amount of artifactual debris generated at different site locations in that no covariant patterning of artifact density and site size is apparent among the site locations. It is felt that artifact densities may thus be monitoring intensity of recurrent utilization of site space, with some site locations being selected

for procurement and consumption with greater regularity over a period of years than others.

Artifact assemblages at site locations exhibiting hearths are characterized by both by-products of tool manufacture in the form of unutilized debitage, cores and occasional hammerstones; and by-products of tool use in the form of utilized debitage, retouched debitage, occasional projectile point or biface fragments, and occasional resharpening flakes. Milling implements including manos and metates are in evidence at only 10 of the 22 site locations, although it was noted during the course of survey that the sampling procedures employed were not documenting the occurrence of these low-count items in some cases.

Ceramic fragments were found at nine open site locations exhibiting hearths (Table VI.2) and ranged in frequency between 1-15 sherds. As noted previously, a major analytical problem resides in determing to what degree the presence of ceramic fragments at such site locations implies extensive utilization of the site area for procurement and consumption activities by non-Archaic populations. Two possible explanations can be posited to account for the presence of ceramic fragments at these sites:

1) the site locations were originally deposited by Archaic populations, and later employed for similar procurement and/or consumption activities by Anasazi populations;

2) the site locations were deposited by Anasazi populations engaging in procurement and consumption activities similar to Archaic populations.

Of the two explanations, the first seems at this point to better account for variability exhibited among the site locations. All exhibit quantities of firecracked rock which are presumably by-products of stone boiling techniques of consumption, and it seems unlikely that sedentary

population having ceramic vessels as an existing technological component of consumption activities would engage in stone-boiling procedures.

The artifact assemblages at site locations exhibiting ceramic fragments are not substantially different from assemblages found at non-ceramic site locations. Those differences which are apparent are of an essentially "additive" nature, in that some artifact classes characteristic of Anasazi technology such as two-hand manos, distinctive projectile point taxons and hafted mauls are found at a few site locations otherwise characterized by artifact assemblages indistinguishable from non-ceramic sites.

It is clear, however, that Anasazi utilization of some of these site locations can be documented, and the contexts of that usage are potentially quite informative about the structure of sedentary agricultural adaptation which evolved within the study area through time. Six of the nine site locations exhibiting ceramic fragments can be assigned to the PIV period of Anasazi adaptation, and the implications of this aspect of PIV non-agricultural food resource procurement strategy will be discussed in Section VI-D.

The remaining eight open site locations within the project area do not exhibit evidence of consumption and are characterized largely by stone artifactual remains. Three of these exhibit a single ceramic fragment, and one exhibits two fragments. With one exception, these site locations fall within the lower ranges of size and artifact density variability exhibited by open sites exhibiting hearth areas. Evidence in the form of debitage utilization and presence of milling implements suggests that these site locations were employed for procurement activities of some sort, however, and thus differ from other open sites primarily through the absence of direct evidence of consumption. In this respect, they differ as well from

previously documented interpretations of non-hearth open sites (Flynn and Judge 1973; Snow 1973c) which have suggested that many such site locations were deposited through tool manufacture activities.

Summary

The significance of the 30 site locations discussed above can be assessed according to their potential informative value about the operation of two kinds of adaptive systems: nonagricultural foraging systems, and sedentary agricultural systems. At this time, archeological documentation of Archaic foraging adaptation within the general Middle Rio Grande region is very minimal. The dynamics of Archaic adaptation can only be postulated from existing models of foraging behavior, and the specifics of Archaic behavior in the Middle Rio Grande are essentially unknown.

The 30 site locations documented during survey of the Cochiti Reservoir thus offer considerable potential for specifying many aspects of seasonal mobility and resource-specific procurement and consumption strategies implemented by Archaic populations within a narrow set of environmental constraints. The site locations appear to be loci at which a relatively few number of individuals aggregated for specific resource procurement purposes over relatively short periods of time. Some site locations exhibit evidence of recurrent reoccupation for similar purposes and it may be suggested that seasonality in the productivity of a finite set of floral or faunal resources within the vicinity of White Rock Canyon was conditioning the kind and temporal occurrence of activities carried out at the site locations. The degree to which procurement strategies carried out at different site locations could be isolated as essentially similar or different would provide considerable insight into this program.

The few site locations exhibiting ceramic fragments are, if positive

assignation of their utilization can be made to later agriculturally based adaptive systems, potentially quite informative about the non-agricultural strategies of resource procurement undertaken by Anasazi populations. This aspect of Anasazi adaptation is very poorly documented archeologically at present, and less well understood.

One major problem which must be resolved through any future archeological research concerning these site locations is that of dating their deposition in either relative or absolute fashion. Once the site locations can be ascribed to the operation of either Archaic or Anasazi adaptive systems in the past, their potential information value will be considerable.

C. Early Horticultural Adaptive Systems

Early horticultural adaptation is a recurrent process in many parts of the world (Boserup 1965) and is often characterized by relatively sudden change from foraging system states to sedentary agricultural system states (Eddy 1966; Brew 1946; Morris and Burgh 1954). The dynamics of the change to a horticultural adaptation are poorly understood for the Middle Rio Grande area and the archeological documentation for this area is limited although a few sites have been located and excavated (Frisbie 1967; Rinehart 1967, 1970; Lange 1968; Snow 1971). This period of change is predicated on the production of maize and a related set of crops and is characterized by an investment into architectural facilities including habitation and storage units, the use of ceramics with increasing diversity in vessel form, capacity and design, and a shift from a seasonally mobile foraging settlement strategy to a more sedentary strategy dependent upon the needs to insure the production of a crop.

In the Middle Rio Grande, this shift to a horticultural strategy is presumed to have occurred between A.D. 600–1200 (BMIII, PI, PII). In the

study area, only 22 sites dating to this phase were recorded (see Fig.VI.2, VI.3) and no sites dating to this phase of adaptation were encountered during the survey of the permanent pool. This absence of sites for this period of time within the permanent pool is potentially informative, however, about the character of this early horticultural adaptation in that such an absence aids in an understanding of the limitations of the early horticulturalists and provides boundaries for that system of adaptation.

D. Sedentary Agricultural Adaptive Systems

Previous research within the study area has largely focused on survey and excavation of site locations dating to the PIII-Coalition (A.D. 1200-1325) and PIV, Classic, (A.D. 1325-1600) phases of Anasazi adaptation, although the latter phase has been the subject of more intensive study than the former. Prior to the Cochiti Reservoir permanent pool survey, 363 sites exhibiting PIII components and 233 with PIV components have been documented in the study area. Of these 89 are PIII-PIV component sites. Information on PIII and PIV sites is derived largely from survey data, although a few sites have been excavated. Despite the amount of research, no substantial attempts have been made to summarize these two phases of sedentary agricultural adaptive behavior in a regional fashion. The following discussion will attempt such a summary through outlining variability in the kind and distribution of site locations exhibiting components dating to each phase. The information this variability provides about processes of adaptation through time will be treated where appropriate.

It should be noted that although the majority of site locations attributable to the operation of PIII and PIV adaptive systems are single component sites, several locations exhibit ceramics indicative of occupation during both phases. The discussion which follows will treat all site

locations exhibiting phase-specific components for summary purposes.

1. PIII Phase (Coalition)

Of the 363 PIII components documented at site locations through previous research, 268 are characterized by architectural structures, 10 are non-architectural and for 85 sites no information is available. The structural sites exhibit a range in size from 1-500 rooms in extent (Table IV.30) and are widely distributed across the study area (Fig. VI.4). PIII components are found in two of the major life zones within the study area and in eight different vegetative communities.

The PIII phase of sedentary agricultural adaptation is thus characterized by a dramatic increase in number of site locations and total number of rooms over the preceeding Developmental phases. Considerable variability in site size, as monitored by number of rooms, at each site location is exhibited as well.

A major analytical problem which has not been resolved through previous research is that of explaining the seemingly "sudden" population increase represented by PIII component sites. Hewett (1953) suggested that the high density of PIII site locations within the Pajarito Plateau resulted from a slow in-migration of population throughout the entire PIII phase. More recently, Dickson (1975) has suggested that the increase in numbers of early PIII site locations for a transect from Santa Fe to Cochiti in the Middle Rio Grande region could be accounted for by "indigenous" population growth. Both these explanations were not based, however, upon adequate knowledge of the actual number and distribution of documented PIII components throughout the Pajarito District, or the Middle Rio Grande region. Evaluation of these alternative hypotheses is difficult for two reasons, largely due to a paucity of data derived from the excavation of sites.

Dating of PIII components is entirely based upon ceramic "temporal markers" which encompass a 125 year time span. Santa Fe Black on White (B/W) ceramics have been employed to distinguish PIII components from PIV components characterized by Rio Grande Glaze wares, but no stylistic variation within the Santa Fe B/W taxon has been defined which can be used to stratify temporally the 125 year period over which the type was manufactured. This is unlike other areas in the Middle Rio Grande in which Galisteo Black on White serves as a temporal marker for late PIII.

Specific variability in the character of PIII adaptation to the Middle Rio Grande region and the study area in particular is very poorly documented. While excavated data can be used to suggest that agricultural production of maize provided a substantial portion of the food resource base of the PIII population (Lange 1968) the logistical stretegies of production, processing, transportation, storage and consumption of this resource have not been isolated. It is not known at present whether these logistical strategies involved a high or low degree of seasonal population movement and construction of habitation and storage facilities at different site locations for purposes of production versus consumption. Technological specifics of agricultural production are largely unknown for the PIII period and the degree to which production technology and climatic variation necessitated periodic population relocation across the landscape cannot be posited.

Many questions directed toward isolating the logistical structure of PIII adaptive behavior must be approached before informed explanatory statements accounting for the large numbers of PIII components as "indigenous population growth" or "slow in-migration" can be postulated. Previously documented survey and excavation data, however, can be employed to suggest a rudimentary outline for the directions such research might profitably take.

Characteristics of PIII components which distinguish that phase of adaptive behavior from the earlier Developmental phase and the later PIV phase are the relatively greater numbers of site locations exhibiting PIII components, relatively greater numbers of architectural facilities constructed, and extreme variability in size of components, as monitored by numbers of rooms comprising architectural facilities. It is felt that three possible determinants of the differences must be explored in order to offer explanatory hypotheses for this observed variability.

1) The nature of articulation of individuals into socio-economic subsistence "units" which cooperate in the production and consumption of agricultural food resources must be defined.

Data from excavation of LA 6462 (Lange 1968) suggest that three kinds of architectural facilities were constructed during the PIII phase of occupation of the site. These include surface habitation rooms, defined by the presence of hearths; surface storage rooms, defined by the absence of hearths; and kivas, defined as semi-subterranean structures containing hearths.

Four spatially distinct architectural units comprised of contiguously constructed habitation and storage rooms were defined through excavation, each of which were situated in close proximity to a kiva. Each architectural unit was comprised of three to six habitation rooms and four to 14 storage rooms. Ratios of habitation to storage rooms varied from 1:1 to 1:2.7 per roomblock unit.

If the data from LA 6462 is assumed to be representative of other PIII architectural components within the study area, it can be suggested that basic social and economic components of the PIII adaptive system were households comprised of three or more commensal units which cooperated

in the production and consumption of food resources. A well-defined structure of social integration among commensul units comprising each household is implied through the presence of kivas associated with each. The close spatial proximity of four such households at LA 6462 suggests that mechanisms existed through which these households were articulated into larger social and economic components.

It seems entirely possible that much diversity in the size of PIII components (as monitored through numbers of architectural facilities at site locations) might be accounted for through isolating conditions under which lesser or greater numbers of household components would be expected to interact cooperatively for economic purposes.

2) A second possible determinant of variability in site size and numbers of site locations exhibited during the PIII phase resides in the degree to which food resource production and procurement strategies necessitated seasonal population movement between site locations during the course of a year. If such strategies involved seasonal habitation of architectural facilities nearby field areas for purposes of agricultural production during the growing season, and subsequent habitation at different site locations during the winter months, the total number of site locations exhibiting PIII components would be greater per unit population than if architectural facilities were constructed at only a single site location. The same strategy would be expected to result in greater diversity in site sizes as well.

3) A third possible determinant of numbers and sizes of site locations dating to the PIII phase resides in the degree of population relocation across the landscape necessitated by the interaction of climatic variability and production technology through the 125 year period of PIII

adaptation to the region. There exist at present no means to stratify PIII components into temporal "sub-phases," with the result that changes in settlement strategy characterized by periods of population relocation and architectural construction cannot be isolated. If such means could be developed, changes through time in settlement patterning and site size might be isolated which would provide insight into the nature of adaptive process now obscured by lack of temporal control.

The five site locations exhibiting PIII components documented within the Cochiti Reservoir permanent pool offer significant insight into each of the problem areas concerning the nature of PIII phase sedentary agricultural adaptation within the study area. Three of the site locations exhibit between two and three rooms each, a fourth exhibits an estimated 21 rooms, and the fifth is a non-structural open site. No large PIII components (in excess of 30 rooms) are present within the project area. Because all the sites documented for the project area fall within the juniper vegetative community, the PIII phase site locations offer potential for examining problems concerning seasonality in habitation for food resource production or procurement within a restricted ecological context. Excavation of LA 5014, a single component PIII site comprised of an estimated 21 rooms, would yield data particularly informative about the social and economic articulation of population segments at medium sized site locations (11-30 rooms) which seem characteristic of only the PIII phase within the study area (see Table IV.31). In addition, all PIII site locations within the project area offer potential for developing more sensitive relative or absolute temporal control within the 125 year span of PIII phase adaptation throughout the region.

2. PIV Phase: A.D. 1325-ca. 1600 (Fig. VI.5)

While the PIV phase of sedentary agricultural adaptation spans 275 years,

the majority of PIV sites located in the study area are characterized by Glaze A and B ceramic fragments which date in manufacture between A.D. 1325-1450. A total of 233 site locations exhibiting PIV components have been previously recorded within the study area (Table IV.29) and an additional 24 PIV site locations were documented within the project area during the Cochiti Reservoir permanent pool survey (Tables VI.2, 4-8). Three of these sites had been previously recorded. These site locations are found in the Upper Sonoran and Transition Life Zones and in seven of the 11 vegetative communities defined for the study area.

Several distinct differences between the character of PIV adaptation and PIII adaptation within the study area can be suggested from data concerning the number, kind, size and distribution of PIV site locations. The first of these differences resides in an apparent reduction of total population inhabiting the study area from the PIII phase to the PIV phase. This is reflected in a decrease in total components from 363 during the PIII phase to 233 in the PIV phase (Table IV.29) and a reduction in total number of rooms from 2972 in the PIII phase to 2587 in the PIV phase (Table IV.31).

The second of these differences resides in an apparent change in settlement strategy reflected in the distribution of site sizes (Table IV.32). While site locations exhibiting PIII and PIV phase components range in size from 1-800 rooms, only one or 0.7% of the single components PIV sites exhibits between 11-30 rooms, in contrast to 67 or 24.5% single component PIII sites with 11-30 rooms. Where the PIII sites seem to reflect high counts of small, medium and large sites, a distinctly bimodal size distribution of small and large sites characterized the PIV settlement strategy.

TABLE VI.5

Permanent Pool Survey
Anasazi Structural Components: P-III and P-III - P-IV Phases

Phase	Site #	Rubble Mounds	Estimate # Rooms	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	Bowl	Olla	Lithics #	Sample Unit Size	Lithics per Meter^2	% Utilized Debitage
P-III	5014	1	21	1200	Bench	E	32	17	15	16	9	1.778	ND
P-III	12440	1	2	1350	Terrace	W	15	6	9	19	9	2.111	59%
P-III	12511	1	3	300	Base of talus	E	8	5	3	22	28	0.786	30%
P-III-IV	12522	1 (+ 1 dep)	2	300	Terrace	E	5	4	1	32	9	3.556	ND

TABLE VI.6

Permanent Pool Survey
Anasazi Structural Components: P-IV Phase

Phase	Site #	Rubble Mounds	Estimate # Rooms	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	Bowl	Olla	Lithics #	Sample Unit Size	Lithics per Meter^2	% Utilized Debitage
P-IV	5011	1	3	408	Base of talus	E	5	0	5	15	408	0.037	ND
P-IV	5013	1	1	21	Bench, Base of talus	SW	1	1	0	0	-	-	-
P-IV	12438	1	1	150	Bench	SW	9	4	5	0	-	-	-
P-IV	12443	1	1	348	Terrace	W	24	11	13	7	18	0.389	17%
P-IV	12447	1	1	800	Bench	NE	3	2	1	20	5	4.000	22%
P-IV	12461	2 (terraces)	2	14850	River beach	NW	10	10	0	18	2	9.000	47%
P-IV	12512	1	1	250	Bench	E	11	9	2	55	15	3.667	60%
P-IV	12513	1	1	20	Base of talus	SE	4	0	4	35	20	1.750	22%
P-IV	12514	1	2	36	Base of talus	NE	14	14	0	14	18	0.778	18%
P-IV	12517	1	1	49	Bench	flat	2	2	0	21	20	1.050	ND
P-IV	12519	1	1	64	Bench, Base of talus	NW	2	2	0	9	64	0.141	33%
P-IV	12452(P.2)	1	1	468	Talus	S	5	4	1	31	10	3.100	20%
P-IV	12456	1	2	975	Bench	SW	21	19	2	31	400	0.078	36%
P-IV	12470	1	1	25	Base of talus	SW	3	0	3	0	-	-	-

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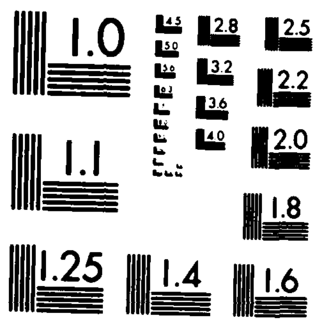
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TABLE VI.7

Permanent Pool Survey
Anasazi Structural Components: P-IV - P-V and P-V Phases

Phase	Site #	Rubble Mounds	Estimate # Rooms	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	Bowl	Olla	Lithics #	Sample Unit Size	Lithics per Meter^2	% Utilized Debitage
PIV-PV	12161	1	1	180	Bench, Base of talus	S	26	11	15	26	180	0.144	0%
PIV-PV	12469	1	1	50	Base of talus	SW	4	3	1	0	-	-	-
PV	(Prov.1) 12452	1	2	468	Talus	S	5	1	4	28	8	3.5	25%
PV	12466	3	3	800	Talus	S	2	ND	ND	16	8	2.0	12%

TABLE VI.8

Permanent Pool Survey
Anasazi Structural Components: Unknown Phases

Phase	Site #	Rubble Mounds	Estimate # Rooms	Site Size Meter^2	Physiographic Situation	Exposure	Ceramics	Bowl	Olla	Lithics #	Sample Unit Size	Lithics per Meter^2	% Utilized Debitage
	5012	1	3	504	Bench	E	7	0	7	19	504	0.038	ND
	12451	1	2	20	Bench, Base of talus	NW	0	-	-	1	15	0.067	0%
	12462	1	1	400	Bench	NW	0	-	-	1	400	0.002	0%
	12480	1	3	36	Base of talus	SE	0	-	-	2	36	0.056	ND
	12518	1	1	49	Base of talus	SE	0	-	-	13	49	0.265	ND
	12520	1	1	64	Terrace	E	0	-	-	16	64	0.250	50%
	12509	1	1	140	Base of talus	E	0	-	-	75	140	0.536	0%

The third of these differences resides in an increased variability in kinds of site locations exhibiting PIV components. While PIII sites are predominantly characterized by structural sites (sites with rooms), several PIV phase sites are open, non-structural sites, shelters and agricultural terraces (Table IV.34). During survey of the Cochiti Reservoir permanent pool, two constructed trails were also encountered. Both of these were characterized by "trailside" scatters of Glaze A and B ceramics, which suggests that they were used, although not necessarily constructed during the PIV phase as well. Additional features similar to prehistoric Chacoan roads were observed from aerial photography within the study area, but their ground truth has not been assessed at this writing (Loose, personal communication).

Several implications concerning change in the structure and organization of adaptive behavior within the study area between the PIII and PIV phases can be suggested from these data. These include a shift toward increasing investment in procurement of nonagricultural food resources which is reflected through substantially greater numbers of non-structural site locations exhibiting PIV components. Twenty-eight such PIV site locations have been previously recorded within the study area and an additional seven non-structural sites exhibiting Glaze A and Glaze B ceramic fragments were documented within the project area during survey of the Cochiti Reservoir permanent pool (Table VI.2, 4). Only seven open sites exhibited Santa Fe B/W ceramics (PIII) in the study and project areas.

A shift toward intensification of labor investment into food resource production is apparent in the construction of agricultural terrace facilities during the PIV phase. A total of seven single component and three multi-component PIV terraces have been previously recorded within the study area,

while only two terraces exhibiting PIII components have been documented (Table IV.34). One set of terraces was recorded during intensive survey of the project area, which exhibited Glaze A and Glaze B ceramic fragments suggesting its use during the PIV phase.

The PIV settlement pattern reflects a two-fold strategy of population aggregation in large centers, and dispersal across the landscape at small one to five room site locations (Table IV.31). This patterning of settlement is considerably different from the PIII phase strategy, in which the majority of site locations exhibited between six and 30 rooms.

While the processes underlying changes in food resource procurement, production and settlement strategy between the PIII phase and the PIV phase are unknown at present, they seem to have resulted in a much more highly organized system of social and economic behavior in the latter phase. Several specific problem areas concerning this adaptive change can be posited as productive lines of research resulting in its explanation.

1) One direction research should take is isolation of the structure and socio-economic articulation of population segments during the PIV phase. Data from two excavated sites, LA 6455 and LA 70, suggest that little change in the structure of households occurred between the PIII and PIV phases. The Western Sector of LA 6455 was constructed and inhabited during the PIV phase (Lange 1968) and was comprised of a single roomblock of 11 habitation rooms and 15 storage rooms. Two kivas were associated with the roomblock. While no data concerning room function is presently available for LA 70, the Glaze A component at that site was comprised of 96 rooms and eight kivas, while the Glaze B - Glaze C component was comprised of 93 rooms and seven kivas. The ratio of rooms per kiva for all three of the above PIV components thus ranges from 12 rooms per kiva to 13.2 rooms per kiva. This

is quite similar to the average of 12.5 rooms per kiva found for households comprising LA 6462, a PIII phase site previously discussed.

It can be suggested from these data that the structure of household composition is quite similar throughout the PIII and PIV phases. Households of four to six commensal units which cooperated in the production, storage and redistribution of food resources seem to comprise minimum components of the social and economic system.

A much more highly organized articulation of these components is indicated, however, in the inter-household organization of labor for contiguous habitation construction, and in the relatively greater numbers of households comprising large settlements themselves. The degree to which the existence of such large population centers during the PIV phase reflects a more highly organized social and economic articulation of households for purposes of food resource redistribution and exchange of other goods and services cannot be definitively stated at present. Possible evidence of such organization can be suggested from the construction of trails and agricultural terrace facilities during the PIV phase. Such construction may have been undertaken as public work projects necessitating labor contributed by members of many households within administrative contexts transcending short-term social and economic interaction among households.

2) A second direction research can profitably take is that of isolating the degree to which the PIV settlement strategy reflects seasonal population movement for purposes of food resource procurement and production. The bimodal distribution of site sizes may reflect seasonal dispersal of population across the landscape at small open and 1-3 room site locations for purposes of agricultural production and nonagricultural food resource procurement during the late spring, summer and early fall, and subsequent

aggregation at large population centers after the growing season. This kind of seasonal population dispersal and aggregation, if characteristic of the early PIV settlement strategy, would reflect a great degree of specialization in resource procurement and production, and a more highly organized articulation of subsistence-related behavior than apparent during the PIII phase.

Of the 24 site locations exhibiting PIV components documented during survey of the Cochiti Reservoir permanent pool, seven were open sites (Tables VI.2, 4), and 17 were one or two room structures, one of which was situated in close proximity to a set of agricultural terraces (Tables VI.5-7). These site locations are potentially quite informative about many aspects of the PIV adaptive system, especially with regard to overall strategies articulating food resource procurement and production behavior with consumption needs of the population. Small sites and open sites comprise an aspect of PIV adaptive behavior which has not been previously studied in any systematic fashion, and their potential significance in understanding the kinds of subsistence related behavior undertaken at them in relationship to subsistence related behavior undertaken at large population centers during the PIV phase is considerable.

3) A third direction research concerning the PIV phase adaptation can take is that of isolating processes underlying change in the organization of adaptive behavior apparent during the phase. Such research should focus in part upon documenting climatic parameters conditioning agricultural production during the PIII and PIV phases in order to posit the overall productive potential of the study area and the region through time, given specific agricultural production technologies. Such procedures could result in isolating the degree to which change in the organization of subsistence

related behavior, and change in the technology of production were adaptive responses to a changing environment, or were conditioned by other parameters.

Especially critical in this regard is determination of when organizational changes apparent in the PIV adaptive system were initiated. Fully eight of the 20 large site locations exhibiting PIV components are characterized by PIII components as well (Table IV.32). It is thus possible that processes underlying the PIV settlement strategy were initiated during the latter part of the PIII phase of adaptation. As noted previously, no means exist at present to date adequately PIII phase site locations relative to one another within the phase.

Thus the PIV sites located during the permanent pool survey of Cochiti Reservoir offer tremendous potential for investigating aspects of the PIV adaptive system, in particular, those involving the small structural and specialized production and procurement sites (1-5 room *sites*, *open sites*, shelters and terraces). Past investigations concerning PIV sites have focused on the large, aggregated centers and have generally ignored the smaller PIV components or dismissed them as "field houses." An examination of the patterning of PIV sites in both the study area and project area suggests, however, that the smaller components are not uniform and, in fact, potentially reflect several different aspects of the PIV production and procurement adaptation. Further, those sites in the project area offer the potential of a test case for an area otherwise marginal to an agriculturally dependent, sedentary system.

E. <u>Historic Period Adaptive Systems</u> (A.D. 1540 - A.D. 1975)

The Historic period (A.D. 1540 to present) is characterized by a great degree of rapid change in the structure and organization of adaptive

behavior within the Southwest in general and the study area in particular. The early phases of the Historic Period (Table VI.9) resulted in the introduction of horse transportation, domesticated livestock species, old-world agricultural species and gunpowder by in-migrating Hispano populations who were operating as the exploratory and settlement "arm" of a non-industrial state organized adaptive system. During the later phases of the Historic period, populations inhabiting the general Southwestern region underwent further adaptive change as the result of their articulation with the industrially based United States nation-state which assumed political control of the territory in 1846. Mechanized transportation systems introduced into the region during the 1880's facilitated large scale exploitation of mineral and timber resources for industrial markets outside the region. Introduction of a money based entrepreneurially organized economy resulted in a profound re-organization of settlement and subsistence behavior throughout the region. The processes of adaptive change throughout the Historic Period can only be understood through reference to the political, social and economic structure of articulation between local indigenous populations and greater supra-regional nation-states.

Archeological documentation of adaptive change during the Historic Period is difficult because the processes of system change throughout the period are very rapid, resulting in deposition of relatively few site locations attributable to the operation of any given adaptive phase within the Historic Period. The archeological record of these adaptive changes is further compounded in the sense that the adaptive contexts conditioning strategies of food procurement, production, transportation, storage and consumption within the study area were in large part dictated by the political, social and economic organization of nation-states which were

operating over extremely large effective regions when compared to the spatial extent of effective regions of prehistoric adaptive behavior. Thus policies concerning land utilization, trade and political structure which had a substantial impact on the organization of adaptive behavior within the study area, were often instituted from political centers in Spain, Mexico and the eastern seaboard of the United States.

Given these parameters conditioning adaptive behavior within the study area during the Historic Period, seven phases of nation-state articulation within the general region can be defined (See Fig. VI.5):

Spanish Exploration phase (A.D. 1540 - 1598)

Spanish Colonization phase (A.D. 1598 - 1680)

Pueblo Revolt and Reconquest phase (A.D. 1680 - 1692)

Spanish Colonial phase (A.D. 1692 - 1821)

Mexican phase (A.D. 1821 - 1846)

U. S. Territorial phase (A.D. 1846 - 1912)

New Mexico Statehood phase (A.D. 1912 - present)

Archeological resources dating to the Historic period documented within the project area will be discussed in terms of the potential information they provide about adaptive behavior during each of these phases.

<u>Spanish Exploration phase</u> (A.D. 1540 - 1598) and Spanish <u>Colonization phase</u> (A.D. 1598 - 1680)

These two phases of the Historic period are defined with respect to historical events concerning the initial Spanish exploration and settlement of the New Mexico region during the Sixteenth century A.D. Archeological documentation of site locations exhibiting components dating specifically to one or the other of these phases is imprecise, largely because chronological sequences of ceramic manufacture and design have not been

well established for purposes of dating. This summary will first briefly outline the impact of Spanish exploration and colonization upon the operation of indigenous Anasazi adaptive systems as it can be reconstructed from historical documentation and will then discuss problems concerning archeological documentation of that impact.

The Spanish Exploration phase was characterized by a series of four expeditions into the New Mexico area which were undertaken as quasi-entrepreneurial exploratory surveys. The object of these surveys was to gather information concerning the settlement potential, mineral and indigenous labor "wealth" of the northern frontier of the Mexican Viceroyship. Three of the expeditions made contact with inhabitants of Cochiti Pueblo: Coronado in ca. 1540, Chamuscado-Rodriguez in 1581, and Espejo in 1582 (Lange 1959:8-9). Aside from short-term disruption imposed by requisition of food, clothing and habitation space by these expeditions, there is little historical evidence that the indigenous Anasazi adaptive system within the Middle Rio Grande region underwent substantial change in response.

The Onate expedition of 1598 marked the first successful attempt to settle the New Mexico area. After an initial stay near the vicinity of San Juan Pueblo, a base of operations was established at Santa Fe in 1610, and Spanish administrative and economic articulation with the indigenous population continued for the next 70 years.

The impact of this in-migration on the structure and organization of the Anasazi adaptive system was profound. The introduction of domesticated livestock species including sheep, goats and cattle dramatically changed the structure of food resources within the effective environment. The introduction of domesticated horses resulted in an equally dramatic change in the strategy of transportation of both food and technological resources

throughout the effective region of Spanish control. Indigenous Anasazi populations were as well subjected to the effects of a Spanish economic strategy which was predicated upon establishment of administrative control over subsistence related activities.

The Spanish adaptive system was largely dependent upon the labor of indigenous Anasazi populations for procurement and production of food resources, and essentially assumed control of the logistical strategies through which those food resources were stored and redistributed throughout the population. This administrative control was implemented in part through the ecclesiastical "branch" of the Spanish government in which resident priests and friars directly administered the organization of labor for production of foodstuffs, wool, etc. at the local level; and in part through the secular branch of the government in which the governor, his lieutenants and acaldes administered the transportation and redistribution of produced goods, and the organization of labor for protection of the populace against Apachean encroachment.

This administrative system suffered from internal difficulties arising from church-state conflicts over the jurisdictional rights to indigenous labor, and ultimately overtaxed the productive capability of the indigenous work force.

A major problem which the Spanish administrative organization had to cope with increasingly throughout the Colonial phase was protecting settlements of Anasazi and Hispano populations against encroachment of Apachean (Navajo and Apache) populations. Although the details and dynamics of Apachean in-migration and population increase within the Southwest are limited at present, it is clear that their adaptation was largely based upon mobile foraging for food resources, and a minimal degree of

horticultural production. Through the mechanisms of trade and raiding, the Apachean populations expanded their potential food and technological resources to include the domestic livestock and agricultural products available in the Anasazi and Spanish settlements.

Spanish administrative policies substantially disrupted pre-existing trade relations between Anasazi and Apachean populations which resulted in considerable stress upon the latter groups because of their need for Anasazi produced agricultural foodstuffs. Apachean groups responded to this stress through raiding Spanish and Christianized Anasazi settlements for both livestock and agricultural produce, which in turn accelerated dissolution of the already deteriorating system of production and redistribution of foodstuffs imposed by the Spanish administration. These processes ultimately resulted in the Pueblo Revolt of 1680, in which the Anasazi population and Apachean allies united to drive the Spanish out of the entire New Mexican area.

Archeological documentation of these two phases from surficial evidence is difficult because of the imprecise nature of ceramic dating. Both Group E and Group F Glaze Wares were manufactured during both phases, but no single ceramic type within these two groups can be employed to distinguish components dating specifically to either the Spanish Exploration or the Spanish Colonization phase. Such ceramic dating is further hampered because the early variant of Puaray Glaze Polychrome (Group E) began to be manufactured ca. 25 years prior to Coronado's expedition; while Kotyiti Glaze types (Group F) were manufactured throughout the Pueblo Revolt and Reconquest phase as well as during the latter part of the Spanish Colonization phase (ca. 1700). In addition, several historic carbon paint ceramic types (including Tewa Polychrome, Posuge Red and

Kapo Black) began to be manufactured just prior to the Pueblo Revolt of 1680, and continued to be made into the Spanish Colonial phase.

Given this lack of covariance between styles of ceramic manufacture and historically defined phases of adaptation, previous researchers have generally categorized site locations or components exhibiting Group E and F Glaze Wares as dating to the "PV" phase. For purposes of summary, that classification will be followed here.

A total of 37 site locations exhibiting PV components have been previously documented within the study area. Only 17 of these locations are single component sites, while the remainder are multi-component (PIV-PV and PIII, PV) locations. Site locations exhibiting PV components range in size from one to 800 rooms, with the majority of sites falling between one and seven rooms. Both single and multi-component PV sites exhibited a distinct bimodal size distribution of small sites (one to seven rooms) and large sites (112-800 rooms). This size distribution is similar to that characterizing the PIV phase and may reflect a similar strategy of land utilization within the study area by Anasazi populations, despite the effect of Spanish administrative control over other areas within the Middle Rio Grande area.

A total of seven site locations exhibiting PV phase components were documented during survey of the Cochiti Reservoir permanent pool area, three of which had been recorded and excavated during the Cochiti Dam Salvage Project by the Museum of New Mexico. None of these components could be definitively assigned to the Spanish Exploration phase, although there is a strong possibility that some portions of LA 70, a large multi-room pueblo, may have been occupied at that time.

Three site locations exhibited components dating specifically to the

Spanish Colonization phase. They include LA 591, a hacienda comprised of an "L" shaped structure of three contiguous rooms and associated masonry corrals (excavated by the Museum of New Mexico); an indeterminate number of rooms at LA 70, and an early component of uncertain nature at LA 6178 a possible garrison. An additional four site locations exhibited PV ceramics, but could not be more specifically dated. Three of these components were single structures of one or two rooms each, while the fourth component was comprised of three non-contiguous single room structures.

Historical documentation of the structure and organization of Anasazi adaptive systems during the Exploration phase is limited to sketchy accounts compiled during exploratory expeditions into the New Mexico area. Although three of these expeditions reached Cochiti Pueblo, none of the accounts can be used as documentation of Anasazi adaptive behavior within the study area proper.

Historical records treating the Spanish administration of Anasazi populations and contexts of Spanish settlement within the study area during the Colonization phase are equally sketchy. Initially the nearest major parish serving as a center of administrative control in the vicinity of the study area was at Santo Domingo Pueblo, and included Cochiti Pueblo as a visita. A resident friar is noted at Cochiti Pueblo itself in 1637, and a mission was apparently established at Cochiti by 1667 (Lange 1959:9).

It thus seems apparent that the population of Cochiti Pueblo was being administered by the Spanish government during the Spanish Colonization phase, but data concerning the effect that administration had upon the subsistence related activities of the Cochiti population is absent. It is not known from historical documentation if the Spanish administration involved use of Cochiti labor for pastoral herding within the study area,

or focused upon exacting tribute in the form of agricultural foodstuffs produced by the population, or both. The presence of several large and many small PV sites within the study area is not mentioned in the historical literature. This fact suggests that the PV sites within the study area were either not inhabited during the Spanish Colonization phase, or were inhabited by Anasazi populations who were not articulating with the Spanish administration throughout the phase.

In either case, the site locations documented archeologically are potentially informative about processes underlying the dynamics of Anasazi adaptive behavior in response to Spanish in-migration and administrative control of indigenous populations which are largely unknown from historic records.

Another realm of adaptive behavior which is not documented well in the historical accounts is that of the articulation between Spanish settlers and indigenous Anasazi populations. Excavation of LA 591 and LA 70 has provided direct archeological evidence of Spanish homesteading within the study area in where the herding of domesticated cattle, sheep and goats were subsistence activities. Evidence of consumption of agricultural products is apparent at these site locations, but the contexts of production are unknown. The degree to which Spanish homestead settlers were articulating economically with local populations of Anasazi agriculturalists is not documented in historical accounts, and site locations dating in deposition to the Spanish Colonization phase potentially offer great insight into the dynamics of such economic relationships.

<u>Pueblo Revolt and Reconquest Phase</u> (A.D. 1680 - 1692)

The combined effects of Spanish administrative disruption of the Anasazi-Apachean system of food resource procurement, production and

redistribution, and deteriorating administrative organization of ecclesiastical and secular branches of the Spanish government led to severe stress upon the productive capabilities of the indigenous work force throughout the effective region of Spanish control by the 1670's. A severe, region wide drought and at least two epidemics during the 1670's accelerated processes which led to the Pueblo Revolt of 1680 in which the Anasazi population of New Mexico and many Apachean allies undertook an organized rebellion and drove the Spanish from the entire area. Spanish control was re-established in 1692 by De Vargas' reconquest.

Little is known either historically or archeologically of the nature of Anasazi and Apachean adaptation throughout the Revolt and Reconquest phase, and no means exist to assess site locations or components to this phase through surficial documentation. Only one site location within the study area (LA 295, or Old Kotyiti) has been positively dated through dendrochronology to have been constructed, inhabited and abandoned during this phase. No site locations exhibiting definite Revolt and reconquest components were encountered during survey of the project area.

Descriptions of Anasazi settlements recorded during De Vargas' reconquest in 1692 suggest, however, that the phase was characterized by a great degree of population movement throughout the region. The degree to which such movement reflects attempts to re-establish a regional system of food production and redistribution, or reflects a period of disorganization and local group attempts to redefine effective territories for food resource production and procurement is unclear at present.

<u>Spanish Colonial Phase</u> (A.D. 1692 - 1821)

This phase was initiated by De Vargas' expedition to re-establish Spanish control over the New Mexican frontier. The economic strategy of

Spanish adaptation during this phase changed from that employed during the Colonization phase. While a somewhat similar ecclesiastical and secular administrative structure was employed to administer the indigenous labor force, homestead settlement of many areas by Spanish and "naturalized" Hispano-Indian households was encouraged on a large scale. The Colonial phase was thus characterized by continual in-migration of individuals, families and households for purposes of settlement rather than administration. A system of land grants was established to convey both exclusive and common rights of agricultural and pastoral land usage to individuals and groups of families. Extensive trade in woolen yardgoods was established between New Mexico and Mexican markets, which gave rise to partido sheepherding as a major economic strategy dictating land usage within many parts of New Mexico.

Trade exchange of food resources between Anasazi and Apachean groups was essentially cut off by Spanish intervention, but during the Colonial phase large scale livestock herding helped provide a food resource buffer to complement the predominately agricultural production of Anasazi populations. This strategy, while in part solving problems concerning the regional system of procurement, production and redistribution of agricultural and faunal food resources for Anasazi and Spanish populations, accelerated raiding activities by Apachean groups, and necessitated considerable investment of time and labor into defensive and offensive military operations.

A system of presidios, or small forts, were constructed near settlements at the fringes of the effective region of Spanish control shortly after the reconquest. Small companies of Spanish soldiers were garrisoned at these presidios for defensive purposes. A second military strategy employed involved a series of major offensive campaigns undertaken with large

companies of Spanish and Anasazi soldiers into frontier areas inhabited by Apachean groups with the objective of killing or capturing individuals for use or sale as slaves. As the New Mexico area became increasingly saturated with Spanish homestead settlers, the presidio system was discontinued, while offensive military campaigns were continued throughout the Colonial phase until the latter two decades of the 18th century.

With the exception of in-migrating settlers, little in the way of direct logistical support for the secular activities of the colony was provided by the Viceroyship in Mexico during this phase. The ecclesiastical branch of the government was provided on a more regular basis with items such as parchment, frocks, cruets, etc. necessary for religious administration of local parishes, and with minimal numbers of implements such as hoes and plowshares to be used in production of foodstuffs to support the ecclesiastical staff of each mission. Spanish settlers were thus largely dependent upon their own or Anasazi labor for manufacture of implements and construction of facilities throughout the Colonial phase.

Historical documentation suggests that two strategies of land utilization for resource production characterized the Colonial adaptation to the study area. Land grants were given for rights to grazing lands on the east side of the Rio Grande river within the study area, and for rights to homestead settlement on the west side of the river.

Although a large number of site locations exhibiting Historic period components have been previously documented within the study area, only six of those were tentatively assigned to the Colonial phase. A total of eight site locations exhibiting Colonial phase components were documented within the Cochiti Reservoir Permanent pool, six of which had been previously, and two of which had been excavated or tested by the Museum of New Mexico.

These site locations reflect the range of homestead, pastoral and defensive adaptations to the region documented in the historical record. LA 6178 (previously excavated by the Museum of New Mexico) is a presidio constructed and used for defensive purposes during the first part of the 18th century (Snow 1973b). Homestead sites include LA 9138, LA 9139 (tested by the Museum of New Mexico) and LA 12507; while pastoral activities possibly resulted in construction of corral walls and/or seasonally occupied short-term herding camps at LA 10110, LA 10111, LA 12160 and LA 12508.

All of these sites are of potentially great significance in that they can provide much specific information concerning the nature of local adaptive behavior of Spanish settlers during the Colonial phase. Archeological documentation of specific subsistence related activities engaged in by Spanish homestead households can provide a realm of information now lacking in the historical record. Critical considerations in this regard include the degree to which early Spanish settlers were dependent upon non-agricultural and non-domestic food resource species for subsistence or upon exchange with local Anasazi populations for food resources. Similarly, much can be learned about the nature of Spanish technology of tool manufacture, ceramic manufacture and house construction which is largely unknown at present. Economic and social relations governing the organization of labor, household composition and interaction between Spanish and Anasazi populations at the local, sub-regional level are poorly documented in the historical record, and site locations within the project area dating to the Colonial phase can provide such information.

Mexican Phase (A.D. 1821 - 1846)

Mexico's revolt and independence from the Spanish empire in 1821

marked the beginning of the Mexican phase. This short phase is poorly documented in the historical record, and no site locations in the study area or the project area can be positively assigned to it. The effect of Mexican independence upon administrative and economic behavior in New Mexico, while poorly documented, seems to have resulted in severing many economic and ecclesiastical ties between the colony and Mexico itself. Many settlers left the colony for Mexico at the beginning of the phase. New Mexico became, in effect, a land-locked, largely self-sufficient colony until 1846. The Santa Fe Trail was established in 1820, marking the first economic interaction between the New Mexico region and the industrially based United States nation-state. While limited trade in wool was engaged in via the Santa Fe Trail, no substantial economic relations were established until the United States acquired the New Mexico Territory in 1846. No archeological sites have been recorded in either the study or project areas which can be assigned definitively to this phase.

Territorial Phase (A.D. 1846 - 1912)

The acquisition of New Mexico from Mexico by the United States in 1846 initiated a series of rapid changes in the structure and organization of adaptive behavior within the region. U. S. military operations resulted in construction of a system of forts around the fringes of the effective region of Spanish and Anasazi settlement, and by the 1870's Apachean populations were largely relocated within reservation boundaries. This permitted expansion of Spanish and in-migrating Anglo settlers into many areas of the region which were previously uninhabitable due to Apachean raiding activities.

An extensive wool trade was established via the Santa Fe Trail, which combined with markets for agricultural food resources, hay and domestic

livestock provided by U. S. military garrisons and government policies of reservation administration, resulted in an entrepreneurial organization of food production and services in many sectors of the region.

Extensive trade for industrially manufactured products including canned goods was accelerated along the Santa Fe Trail during the initial years of the Territorial phase. The introduction of the railroads into the New Mexico territory in the 1880's resulted in massive importation of such goods from eastern industrial centers, and facilitated large scale timbering, mining and cattle raising operations within the territory as well. By the end of the 19th century, a money based economy was operating within the New Mexico territory which was replacing the pre-existing barter economy as a means of redistributing goods and services. Wage labor job opportunities were provided through mining and timbering operations, and a network of retail store outlets for industrially produced foodstuffs and technological items provided the basis for a gradual region wide change in subsistence related behavior.

Only a few site locations dating to the Territorial phase have been recorded through previous research within the study area, while seven site locations exhibiting Territorial phase components were recorded during survey of the Cochiti Reservoir permanent pool (Table VI.9). Site locations within the study area and project area reflect the operation of three distinct land utilization strategies throughout the Territorial phase. These include homestead settlement, short term camps and towns owing their existence to timbering and mining operations, and seasonally utilized herding camps.

The Rio Chiquito drainage served as a major location of homestead settlement within the study area. Referred to as La Canada, this community

was established during the Colonial phase, and was inhabited by fluctuating numbers of households engaged in subsistence farming and herding until the early 20th century. The short-lived town of Bland was established in the early 1890's after a gold and silver strike in Bland Canyon, and supported a large population for ca. 10 years of mining operations. A seasonally inhabited timber camp ("Boom") was established on the east side of the river at the head of a railroad spur from 1907 to 1912, where railroad ties manufactured by crews in the Pajarito Plateau were collected from the Rio Grande after being "boomed" down White Rock Canyon, and loaded onto cars for rail transportation to other parts of New Mexico and the southwest for track building.

Four sites within the project area (LA 12449, LA 12465, LA 12485, and LA 12488) represent seasonally occupied camps and/or corrals used for pastoral cattle and sheepherding within the project area. Another aspect of this specialized herding utilization of the study area is represented by a pumphouse (LA 12453) constructed on the east side of the river across from Capulin Canyon, and another location (LA 12458) across from Bland Canyon which has apparently been leveled for construction of a similar facility.

It is quite possible that many of the corral, pen and windbreak structures comprising the majority of undated site locations in the project area may have been constructed during the Territorial phase as well.

In summary, the study area exhibits archeological resources reflecting a full range of adaptive behavior characteristic of the Territorial phase including homesteading, herding, mining, timbering and railroad construction. The project area, as defined by the Cochiti Reservoir permanent pool, reflects only part of this adaptive behavior archeologically, in that direct archeological evidence of mining and homesteading activities are not found.

New Mexico Statehood Phase (A.D. 1912 - Present)

The Statehood phase is defined by the change in political status of articulation of the New Mexico area with the United States. Site locations within the study area exhibiting components dating to this phase have not been systematically documented through previous archeological research. This is possibly due in part to a commonly held bias that "modern" historical remains do not constitute a proper realm of archeological research, and possibly due to the fact that processes underlying changes in regional adaptive behavior since 1912 have resulted in a set of very specialized and peripheral strategies of land and resource utilization within many parts of the study area.

Examples of diversity in specialization of this sort can be illustrated in several ways, not all of which have been documented from an explicitly archeological perspective. Timbering, as an economic enterprise, has continued as a sporadic seasonal pursuit throughout the Statehood phase, and has resulted in substantial road construction within the Pajarito Plateau district, and in construction of a sawmill facility at Domingo along the Galisteo drainage.

Professional anthropological research has constituted another realm of specialized behavior affecting land and resource utilization within the study area. This research dates from the last few years of the Territorial phase to the present, and has been documented in Section IV-A. One major effect of archeological research within the study area has been transformation of the land tenure status of a sizeable portion of the Pajarito Plateau from privately owned to publicly administered National Monument status. Subsequent construction of a visitor center, roads, trails and prehistoric site stabilization projects within Bandelier National Monument

has resulted in recreational utilization of large portions of the study area.

The townsite of Los Alamos/White Rock represents a similar specilization in land utilization strategies dictated by an expanding industrially based nation-state. In the case the need for an "isolated" locus to establish a goal directed research community resulted in construction of roads, habitation facilities and specialized research plants within the northern portion of the study area because of its marginal location with respect to existing population centers elsewhere in New Mexico and the nation-state. Once established, the community has since become an economically viable population center due to its specialized articulation with the greater nation-state. In this sense, the Los Alamos/White Rock settlement supports a resident population through exchange of research services for food and technological resources, much like the economic relationship of the smaller resident population of personnel administering Bandelier National Monument.

Other population centers within the northern portion of the study area were largely abandoned shortly after the beginning of the Statehood phase. The mining town of Bland, which at its height of population during the 1890's boasted 21 saloons, two newspapers and a public school, folded economically at the turn of the century. The community of Canada situated along the Rio Chiquito drainage was depopulated more gradually, and the Canada Grant was ultimately purchased by James Young in the 1920's, who later established a commercial apple orchard at the upper end of the Rio Chiquito. This orchard is still maintained and managed by Mr. and Mrs. Fred Dixon, and the Dixon homestead in many ways represents the last remaining site location within the Pajarito Plateau district at which an agricultural and pastoral adaptation to the environment is still being pursued.

Another realm of specialized land and resource utilization of the northern portion of the study area is reflected in recreational behavior. Intensive survey of the Cochiti Reservoir permanent pool resulted in documentation of 13 site locations exhibiting Statehood phase components. Of these, nine were campsites characterized by fire hearths situated within 10 meters of the river's edge within White Rock Canyon (Table VI.9). An additional nine similar campsites were rêcorded as isolated occurrences, and a variety of isolated beverage cans and bottles were documented as well within the canyon (Table VI.11).

The construction of Cochiti Dam and associated camping and boating facilities can be expected to accelerate recreational behavior within the northern portion of the study area in future years, and represents another stage in the changing articulation of human adaptive behavior and the environment within the northern portion of the study area.

Other *Statehood phase* site locations and isolated occurrences recorded during survey of the project area represent a variety of short-term specialized activities. These include two site locations deposited as byproducts of previous archeological excavation of LA 70 during 1963 - 1965; six occurrences of bait and/or metal spring traps, a herding campsite, and another large campsite characterized by a scatter of cans including lard cans dating to the 1930's. Lange (1959:139) mentions use of spring-traps by the Cochiti for obtaining skunk pelts. Construction of the Cochiti-Frijoles trail was undertaken as part of the Middle Rio Grande Conservancy District operations during the early 1930's, and may have resulted in deposition of the large campsite.

In contrast to the increasingly specialized contexts of adaptation which characterize human behavior throughout the Statehood phase within

the northern portion of the study area, the Rio Grande Valley below White Rock Canyon exhibits three communities which have gradually increased in population since 1912. Two of these, Cochiti and Santo Domingo, are Pueblo Indian settlements which have been inhabited by Anasazi populations more or less continuously from the 11th and 14th centuries A.D., respectively. The third community, Pena Blanca, is a largely Hispano community dating from the late 18th to early 19th century. The populations inhabiting these settlements engage, at present, in a variety of subsistence-related economic strategies including farming, herding and wage labor. The latter strategy is facilitated by an extensive paved road network permitting commuter traffic to either Santa Fe or Albuquerque.

F. Summary of Significance of Cultural Resources in the Permanent Pool of Cochiti Reservoir

One hundred and eight sites were located on the survey of the 1215 acre permanent pool, resulting in a site density of approximately one site per 12 acres or in excess of 53 sites per square mile. An additional 41 isolated occurrences were documented as well. The cultural resources recorded on the permanent pool survey thus reflect a relatively intensive human utilization of the area. This is surprising in view of the restricted nature of the canyon in which the conformation of the terrain affords relatively few flat surfaces suitable for human occupation. These areas are confined predominantly to narrow benches and alluvial fans adjacent to the Rio Grande and comprise less than an estimated 40% of the land area of the permanent pool. Only one ecological community (juniper) was defined for the project area; and although a number of small habitats or ecological niches have been suggested for White Rock Canyon (E.I.S. 1974: II-25), no clear patterns in the distribution of sites or classes of sites in the permanent

TABLE VI.9

Permanent Pool Survey
Historic Period Components

Colonization Phase: 1598-1680

LA 591	"L" shaped unit of 3 contiguous rooms and associated corral structures. A later and unidentified component is also present.
LA 70	Nature of the historic occupation of LA 70 is not certain.
LA 6178	A walled Presidio in the 18th century, LA 6178 was apparently initially occupied in the 17th century by Pueblo refugees probably from the Galisteo Basin.

Colonial Phase: 1692-1821

LA 70	Nature of the historic occupation of LA 70 is not certain.
LA 9138	Rancho of 4 structures and 7 possible rooms, two components are evident. Large areas enclosed by stone walls are associated.
LA 9139	Possibly an 18th century rancho. Structure is rectangular with two contiguous rooms. As in LA 9138, a later component is evident.
LA 10110	Talus wall and petroglyphs. Site appears to be contemporaneous with and possibly associated with LA 9138.
LA 10111	Talus wall, corrals, and petroglyphs. Site is almost certainly associated with LA 10110.
LA 12160	? uncertain as to whether site is associated with this period. Consists of semi-circular structure abutting boulder.
LA 12507	Single rectangular structure, apparently a rancho or field house.
LA 12508	Sub-rectangular structure utilizing large boulders in the walls, although the masonry is comparable to the other sites included in this category (unevenly coursed and mortared). Large areas enclosed by rambling stone walls suggest that this site may be associated with LA 9138.
LA 6178	A Presidio in the first decade of the 18th century. Walled with towers at opposite corners. Several latter components are apparent.

Mexican Phase: 1821-1846

No sites have been definitely identified with this period.

TABLE VI.9 - Continued

Territorial Phase: 1846-1912

LA 12449	Single square masonry room and associated brush corrals dating to the turn of the century.
LA 12453	Pumphouse probably dating to the turn of the century.
LA 12434	"Boom" no structures are evident above lake level.
LA 12465	Three possible field structures and 8 masonry pens and corrals; all structures are abutting cliff face. Date falls between Civil War and 1880's.
LA 12485	"U" shaped structure abutting large boulder.
LA 12488	Apparently a rectangular field structure. Time period is very uncertain.
LA 12458	Area leveled by blasting a base of sheer cliff, sections of steel pipe scattered about which are similar to pipeline from LA 12453.

Statehood Phase: 1912-1945

LA 12474	Semi-circular structure abutting boulder.
LA 12500	Good candidate for early conservancy activity. No structures.

Modern Phase: 1945-present

LA 12435	Cochiti laborers lunch site
LA 12437	Al Skinner's camp site while digging LA 9139
LA 12473	1 hearth
LA 12475	1 hearth
LA 12476	1 hearth
LA 12477	2 hearths and tent base
LA 12484	Bench and driftwood but no apparent hearth area
LA 12487	2 hearths
LA 12493	1 hearth with drift seats
LA 10110	4 hearths
LA 12472	4 hearths and graffiti

TABLE VI.9 - Continued

Unknown Historic Components

LA 12459	Lithic scatter and brush corral ?
LA 12469	Roughly rectangular structure built against a boulder.
LA 12471	Two sub-rectangular contiguous rooms.
LA 12470	Rock masonry shelter, roughly circular.
LA 12472	Rocks stacked up in non-uniform manner.
LA 12489	Petroglyphs, walls with PV to mid 20th century date.
LA 12498	Clast rubble mound, estimated 1 room.
LA 12504	Masonry corrals
LA 12505	Square masonry structure
LA 12506	Talus walls, possibly corrals
LA 12525	Rectangular structure against boulder, storage room, talus wall.
LA 12467	Two stone corrals "D" shaped to sub-rectangular, utilizing existing boulders.
LA 12497	Semi-circular structure built against and beneath boulder.
LA 12523	Semi-circular structure open to the east.
LA 12524	Two circular structures, 2 semi-circular structures (pens ?)
LA 12466	Circular structure abutting cliff face, semi-circular storage like structure, and ephemeral structure in talus.

TABLE VI.10

Permanent Pool Survey
Site Locations of Unknown Period or Phase

Site #	Est. # Rooms	# Hearths	Site Size M^2	Physiographic Situation	Exposure
12441	0	2	50	Terrace	W
12492	1	1	28	Base of talus	S
12497	1	0	12	Base of talus	S
12501	1	0	9	Base of talus	SE
12515	Depression	0	24	Bench	E
12516	1	0	36	Bench	flat

TABLE VI.11

Permanent Pool Survey
Cochiti Project: Isolated Occurrences

Site #	Situation	Vegetative Structure	Trees	Shrubs	Grasses	Cultural Period	Type of Site	Type of Material
CIO-1*	Talus					Unknown	Petroglyph	
CIO-2	Base of talus	Dense Woodland	Juniper			Modern	Rock pile	Steel cable
CIO-3	Base of talus					?	Trap	Metal trap/baited
CIO-4						Unknown	Petroglyph	
CIO-5	Talus					Unknown	Cairn	
CIO-6	Bench	Barren/few trees	Juniper	Snakeweed	gramma	Modern	Can dump	Tin cans
CIO-7	Sand dune	Barren/few trees	Juniper	Snakeweed	dropseed	Unknown	Trap	Trap/bone baited
CIO-8	Bench					Unknown	Rock pile	
CIO-9	Alluv. flats	Open woodland	Juniper	Snakeweed		Unknown	Cairn	
CIO-10	Sand dune	Woodland Mosaic	Juniper			Modern	Isolated tin can	Tin can
CIO-11	Talus	Barren/few trees	Juniper	Pricklyp.	grasses	Modern	Isolated tin can	Tin can
CIO-12	Sand dune	Barren/few trees	Juniper	Cholla		Modern	Isolated bottle	Wine bottle
CIO-13	Sand dune	Barren/few trees	Juniper			Modern	Isolated tin can	Tin can
CIO-14	Talus		Juniper	Snakeweed	dropseed	Unknown	Trap	Metal trap/baited
CIO-15	Sand dune		Juniper	Rabbitbr.		Unknown	Trap	Trap/bone baited
CIO-16						Unknown	Trap	

* CIO = COCHITI ISOLATED OCCURRENCE

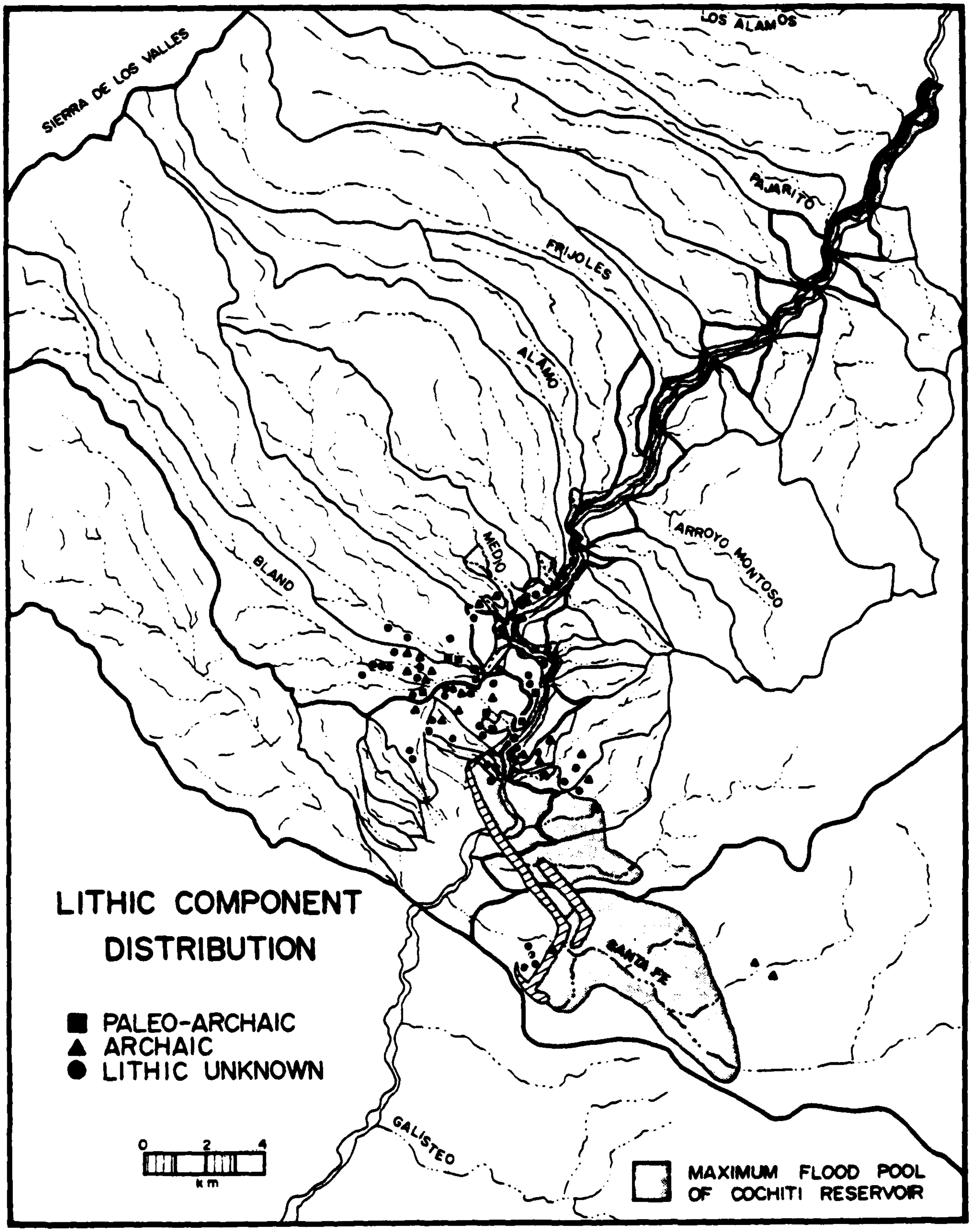
TABLE VI.11 - Continued

Site #	Situation	Vegetative Structure	Trees	Shrubs	Grasses	Cultural Period	Type of Site	Type of Material
CIO-17	Base of talus		Juniper		grama	Anasazi?	Sherd scatter	Sherds & ground stone
CIO-18	Sand dune		Juniper	Snakeweed	dropseed	Unknown	Fire-cr. rocks	
CIO-19	Base of talus		Juniper	Snakeweed		Modern	Fire-cr. rocks	Bottle glass
CIO-20	Sand dune		Juniper			Modern	Isolated tin can	Tin cans
CIO-21	Sand dune					Modern	Isolated bottle	Bottle glass
CIO-22	Sand dune					Lithic unknown	Lithics	Lithics
CIO-23			Juniper			Unknown	Trap	Metal trap/baited
CIO-24						Modern	Isolated bottle	Wine bottle
CIO-25	Sand dune		Juniper	Rabbitbr.		Unknown	Cairn	
CIO-26	Talus	Open woodland	Juniper	Snakeweed		Unknown	Lithics	Chert nodule
CIO-27		Barren/few trees				Modern	Isolated tin can	Tin can
CIO-28	Beach	Sand				Modern	Hearth	
CIO-29	Alluv. flats	Barren/few trees				Modern	Hearth	
CIO-30	Beach	Sand				Modern	Hearth	
CIO-31	Sand dune	Sand				Modern	Hearth	
CIO-32						Modern	Hearth	
CIO-33	Beach					Modern	Hearth	
CIO-34	Beach					Modern	Hearth	

TABLE VI.11 - Continued

Site #	Situation	Vegetative Structure	Trees	Shrubs	Grasses	Cultural Period	Type of Site	Type of Material
CIO-35	Beach					Modern	Hearth	
CIO-36	Bench	Savanna		Snakeweed	gramma	Modern	Hearth	
CIO-37	Canyon bottom					Unknown	Petroglyph	
CIO-38	Cliff face					Unknown	Petroglyph	
CIO-39	Gravel ridge	Open woodland	Juniper	Snakeweed		Unknown	Cairn	
CIO-40	Basalt talus	Woodland Mosaic	Juniper	Snakeweed	gramma	Unknown	Cairn	
CIO-41	Arroyo	Savanna	Elm	Snakeweed	rice	Modern	Can dump	Cans

FIGURE VI.1



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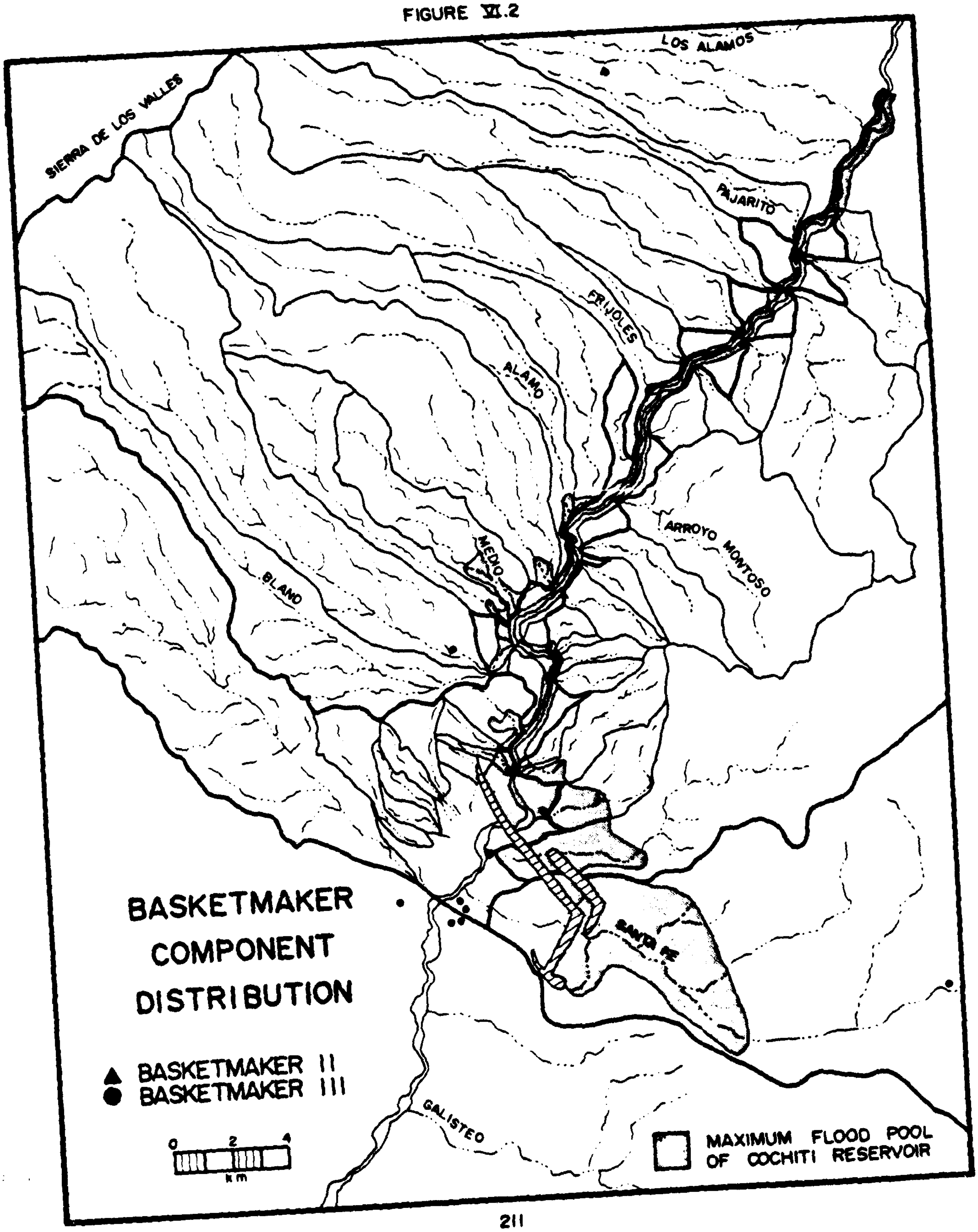
MAXIMUM FLOOD POOL OF COCHITI RESERVOIR

FIGURE VI.2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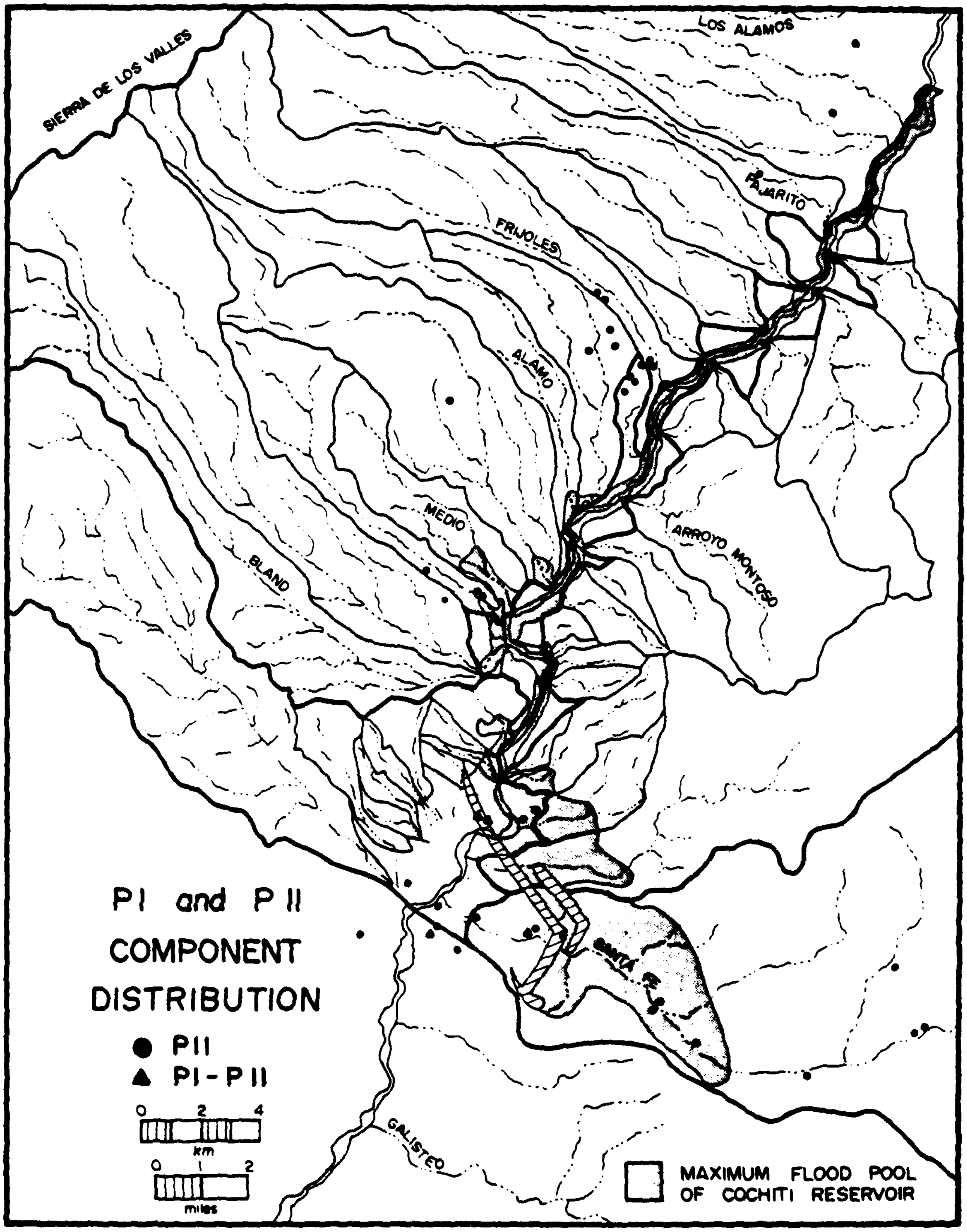
MAXIMUM FLOOD POOL
OF COCHITI RESERVOIR

FIGURE VI.3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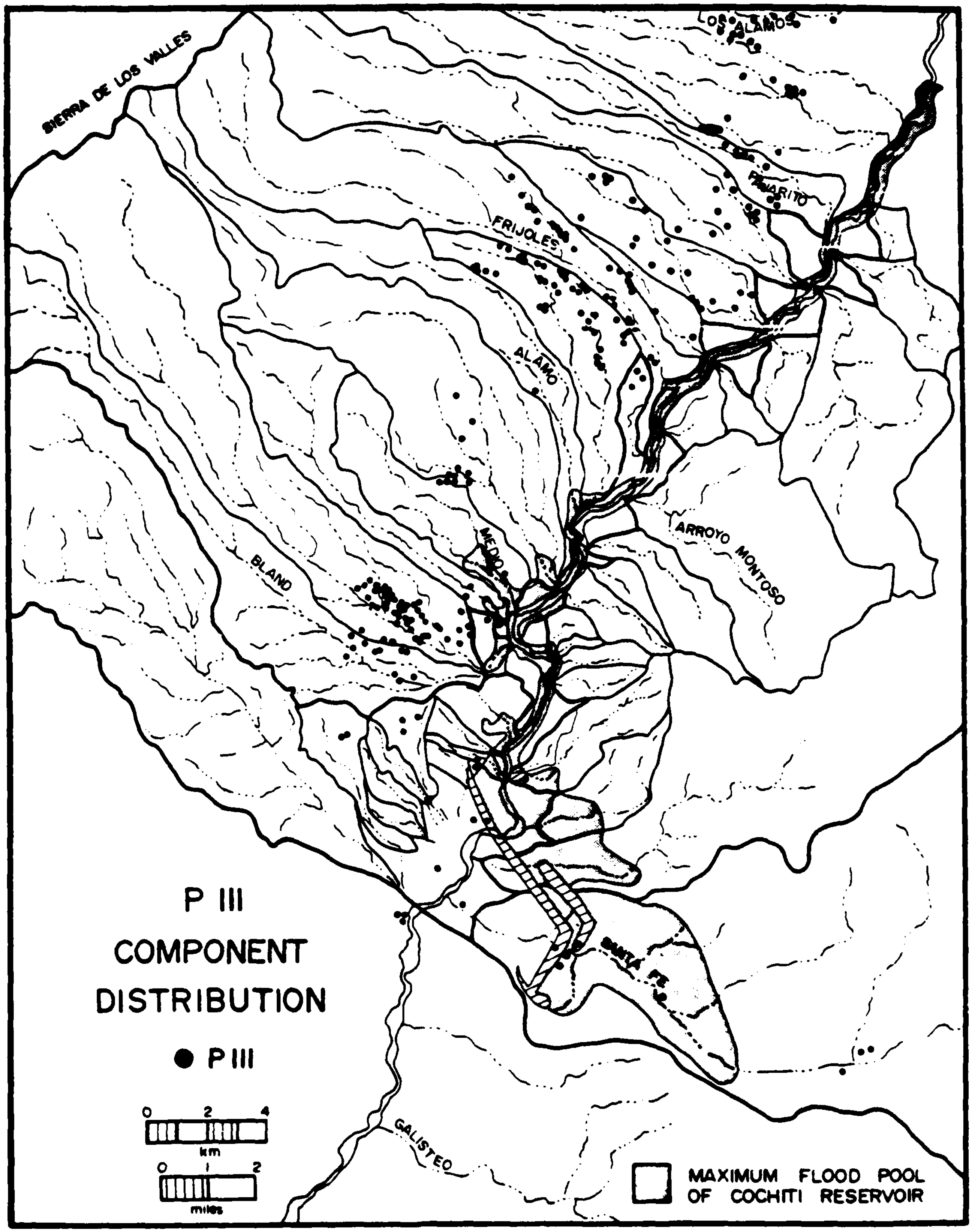
MAXIMUM FLOOD POOL
OF COCHITI RESERVOIR

FIGURE VI.4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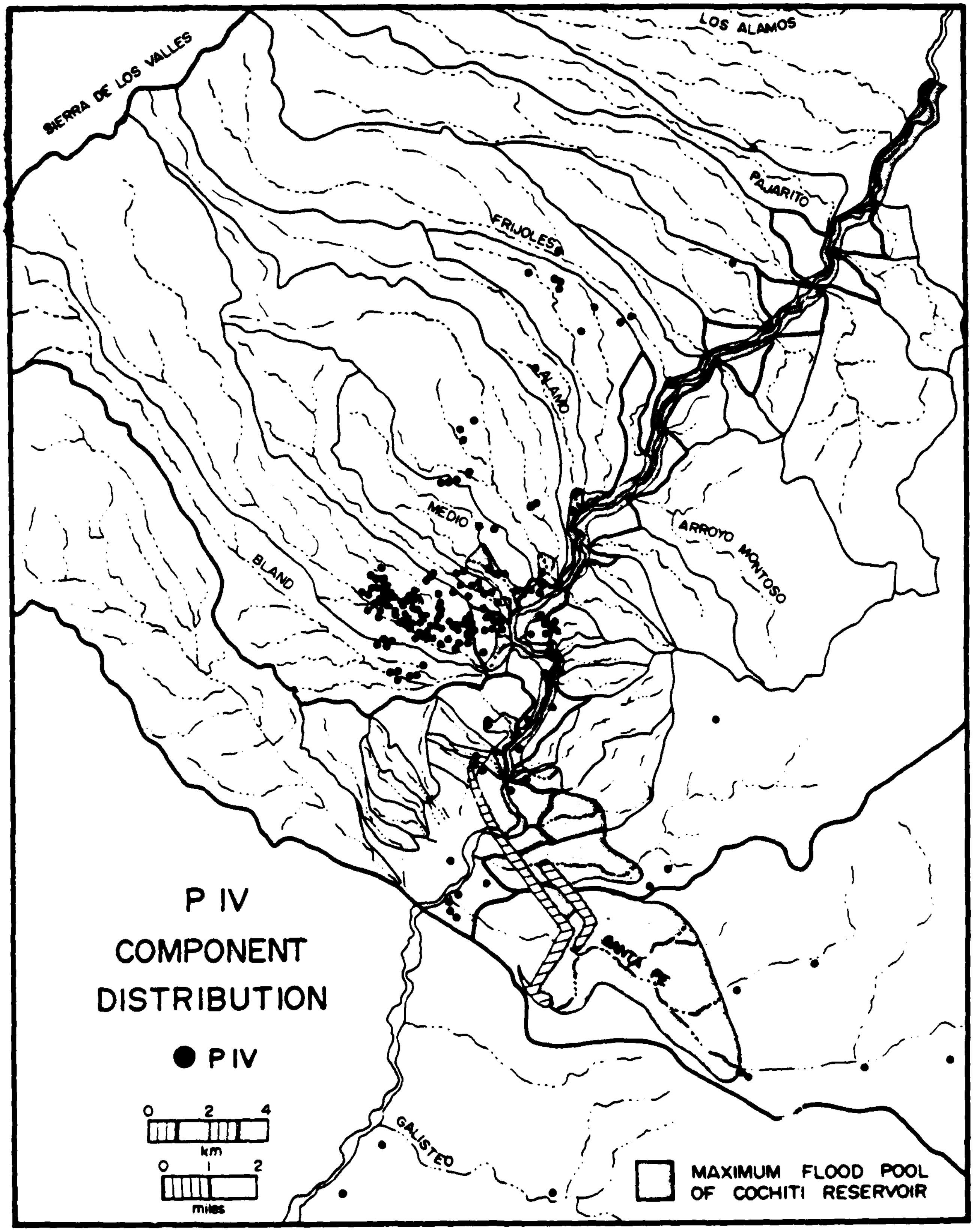
MAXIMUM FLOOD POOL
OF COCHITI RESERVOIR

FIGURE VI.5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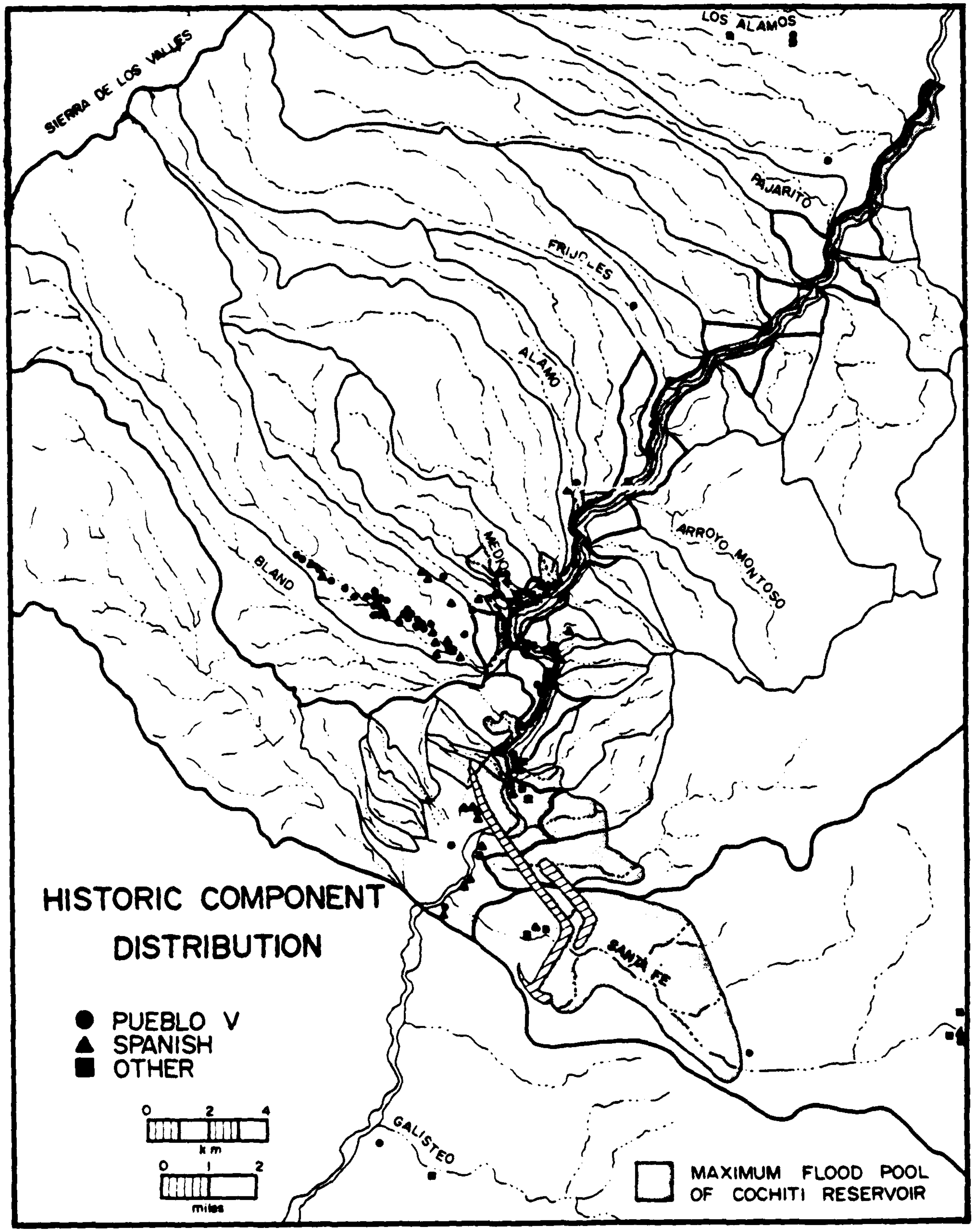
MAXIMUM FLOOD POOL
OF COCHITI RESERVOIR

FIGURE VI.6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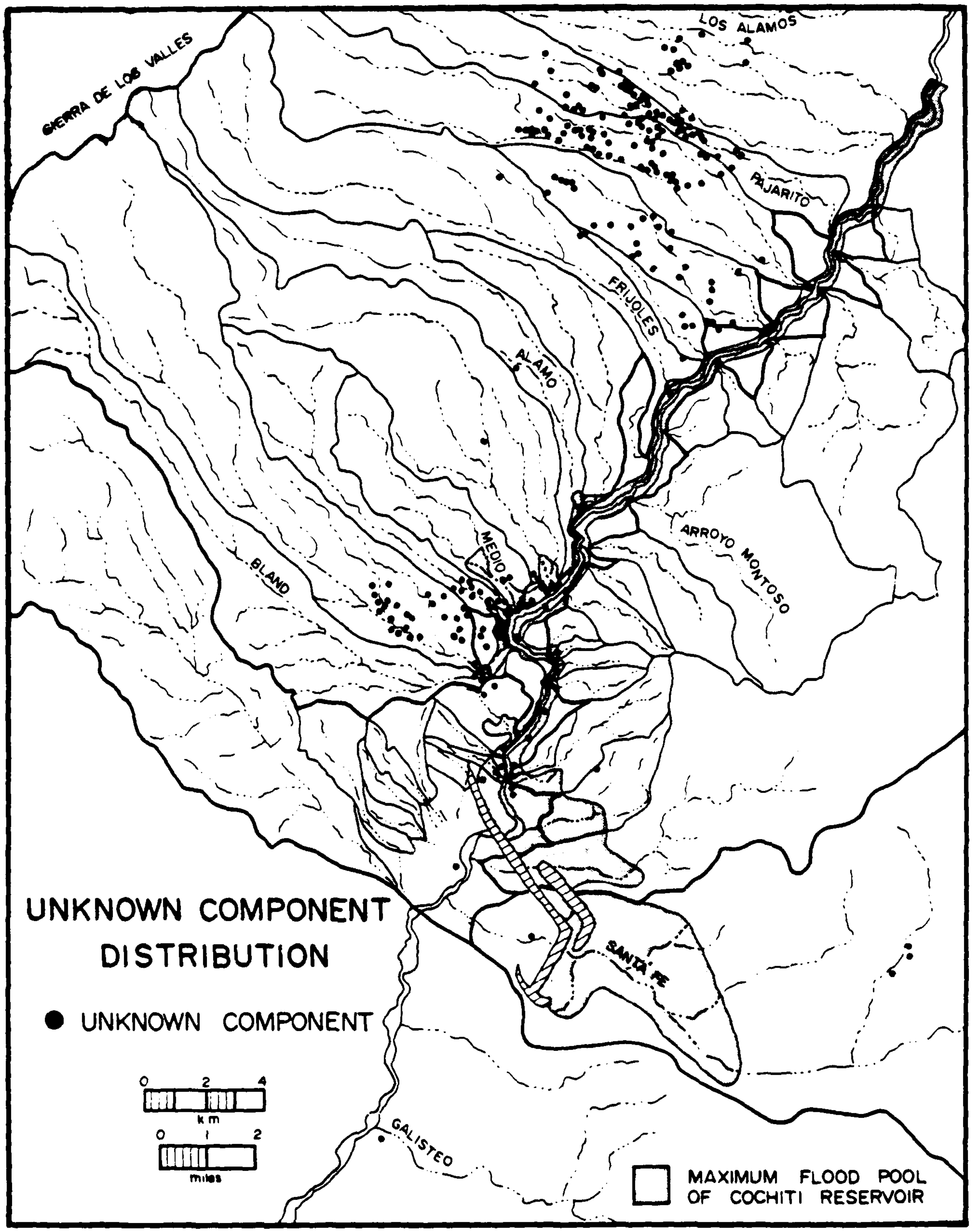
MAXIMUM FLOOD POOL OF COCHITI RESERVOIR

FIGURE VI.7



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DISTRIBUTION
UNKNOWN COMPONENT
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miles
MAXIMUM FLOOD POOL
OF COCHITI RESERVOIR

pool area could be discerned ecologically.

The majority of the sites located in the project area, regardless of temporal period, are small, probably seasonal, procurement and production locales. Although the specific structure of the sites (open camp sites vs. field houses vs. corrals) and the character of the articulation of these sites with their respective adaptive systems differ, a patterning of short-term occupation and apparent seasonality emerges. Only a few sites, notably LA 5014, 9138, 12161 and 12511 suggest a longer, perhaps year-round occupation. This overall similarity in the human utilization of the permanent pool area is distinct from the character of adaptation suggested by previous research in the other districts in the study area. As such, the cultural resources in the permanent pool offer unusual research potential for examining the role(s) of short-term, seasonal site locations in understanding aspects of human adaptive systems in the Middle Rio Grande that have generally been overlooked in previous archeological research in the area. Further, the fact that many of the sites appear to represent single component occupations should facilitate the isolation of different activities conducted at the sites and thus permit a more thorough examiniation of the processes underlying change in human adaptive behavior in the projcet area.

Although none of the cultural resources documented during the survey were formally nominated to the National Register of Historic Places, they nevertheless have the potential to provide scientifically significant information about human adaptation in the Middle Rio Grande. In particular, these cultural resources will permit isolation of variability among the kinds of seasonal, short-term subsistence related activities engaged in at site locations within a restricted ecological context. They will further provide much information about the nature of logistical strategies through which those

activities were articulated into different regional systems of adaptive behavior at different times in the past.

These kinds of information are especially critical in understanding processes underlying change through time in adaptive systems, and constitute an entire realm of cultural variability within the Middle Rio Grande region which is unknown at present. While previous research has focused primarily upon large, permanent settlements, little attention has been directed toward understanding the dynamics of regional strategies of settlement, land and resource utilization through time. Analysis of site locations such as those characteristic of the Cochiti Reservoir permanent pool would thus provide a singificant contribution to Middle Rio Grande archeology through focusing upon the nature of short-term, seasonal subsistence-related activities and their systemic relationship to large settlements.

APPENDIX A

Inventory of Cultural Resources in the Study Area (Previous Research)

In order to place the archeological information collected in Cochiti Reservoir into its general regional and cultural context, the previous anthropological research in areas adjacent to the reservoir has been assembled and abstracted by site in the following printout. Since this area has been the focus of continued anthropological research for nearly 100 years, the variability of information recorded, both in content and format, is extensive. In summarizing this information, an attempt has been made to retain as much of this original variability as possible while ordering the information to facilitate subsequent analyses.

The printout includes information on all known archeological sites lcoated within the following U.S.G.S. 7½ minute quadrangles in New Mexico: Santo Domingo Pueblo, Cochiti Dam, Canada, Frijoles, White Rock and Tetilla Peak. The area investigated extens outward form Cochiti Reservoir 7-10 kilometers to the west and 5-10 kilometers to the east, encompassing approximately 285 square kilometers.

For each site lcoated in the study area, the following categories of information (when present) have been coded:

- Site Number
- U.S.G.S. Quad
- U.T.M. Coordinate
- Elevation
- Drainage Basin
- Ecological Zone
- Type of Data
- Period
- Phase
- Dates
- Site Description
- Lithic Assemblage
- Ceramic Assemblage
- Other
- Sources of Information
- Comments

Each of these categories of information will be discussed below. In particular, the difficulties in coding the information and the reliability

of the information so coded will be discussed.

Site Number

All sites are listed by LA (Laboratory of Anthropology) number.

U.S.G.S. Quad

The 7½ minute quadrangle within which the site is located is listed.

U.T.M. Coordinate

Specific site locations are listed by Universal Transverse Mercator (U.T.M.) coordinates. The coordinate for the centralmost point of a site has been coded. Occasionally a site may have more than one location or the location for a site may be missing. In such cases, the U.T.M. coordinate has been deleted.

Elevation

Site elevation is listed in feet and meters. When a site encompasses a range in elevation, the average elevation has been coded.

Drainage Basin

The name of the drainage basin in which the site is located is listed. If a site is located in an unnamed drainage basin, the nearest named drainage basin is listed with the exception of a series of unnamed drainages adjacent to the Rio Grande which have been listed by an arbitrarily assigned number. The boundaries of both the named and unnamed (numbered) drainage basins in the study area are marked on a set of U.S.G.S. 7½ minute quadrangles on file at the Office of Contract Archeology.

Ecological Zone

The ecological zones listed in the printout were largely interpreted from a single frame of false-color infrared film with a scale of 1:114000. Although this frame covered most of the study area, portions of a number

of the quadrangles were not encompassed by the film. The ecological zones for these areas were interpolated if collaborating information (often in the form of species lists on site forms) were available. When no ecological information was available, the category for ecological zone was listed as unknown. Three major ecological zones occur in the study area: Upper Sonoran, Transition and Canadian. Since differences in dominant species within these zones could be ascertained from the aerials, the various dominant species were also coded. Thus the ecological zone for a site might read: Upper Sonoran: Juniper Grassland. Sites that were located on the boundary between two or three zones or within 100 meters of a boundary were coded as "ecotone" and the two or three zones involved were lsited, e.g., Ecotone: Juniper Grassland/Pinyon. The ecological zones and boundaries between zones are marked on a set of U.S.G.S. 7½ minute maps on file at the Office of Contract Archeology.

Kind of Data

Since the reliability of information derived from survey, excavation and testing differs, the kind of field work or basis for the data has been listed. When available, the year, institutional affiliation, and name of the person recording the information is listed.

Period

This category refers to the major temporal and/or cultural period during which the site was occupied. If a site spanned more than one period, each period is listed. Examples of periods are Archaic, Basketmaker, Anasazi and Historic. After this and several other categoires, two symbols may appear: * or +. An * denotes that the preceeding information is conflicting and a + denotes information that was interpolated from existing information for analytical purposes at OCA. All other entries replicate

the original source information as much as possible.

Phase

These are smaller temporal and/or cultural sequences within a period. Phases within the Anasazi Period, for example, are PI, PII, PII, etc.

Dates

Whenever dates are given for an occupation of a site, these are listed.

Site Description

An attempt was made to replicate the original site descirption using the same terminology whenever possible. As such, the site descriptions are quite variable. Further, the format for site description was designed to summarize an entire site as a single unit. Consequently, multicomponent sites with distinct temporal or spatial units could not be described separately. Thus, if a site consisted of two discrete components, one a PIII 20-room pueblo and the other a PIV 2-room field house, the coded site description would read: PIII, PIV: 2 noncontiguous roomblocks, 22 rooms, 2 distinct components. A problem developed with information about sites that listed roomblock size by dimensions but not by estimated number of rooms. Since the site description format was designed to handle counts and not dimensions, sites that were described by dimension had to be converted into comparable room counts in order to retain information about the size and extent of these sites. This was accomplished by computing the number of square meters in a roomblock or a series of roomblocks and then assigning a nominal size--large, medium or small--to each site. A figure of 9 m^2 per room was used as an estimate for room size such that:

1-10 rooms	=	0-100 m^2	=	small site
11-30 rooms	=	101-300 m^2	=	medium site
31 + rooms	=	301 + m^2	=	large site

This conversion has only been applied to one body of data, that collected

by Steen 1974-1975 (LA 12589-12720). Other sites that are described as small, medium or large reflect the original source information. If there was conflicting information concerning the description of a site, "conflicting information" follows the site description. If there was no information about the site description, "no information" was coded.

Site Size

The dimensions of the site are listed in feet and/or meters.

Lithic Assemblage

Since the majority of information concerning lithic assemblages was not quantifiable, the printout only records the presence of different categories of lithic artifacts on a site. Thus the lithics from a site may be listed as: chipped stone, projectile points, scrapers, manos,etc. When no specific information concerning the lithics on a site was available, or if no lithics were noted on a site, this category was deleted from the printout.

Ceramic Assemblage

The majority of information on ceramics was not quantifiable. For this reason, only the occurrence of different ceramic types were listed on the printout. With the exception of the Glaze I-VI sequence which was coded GlazeI=Glaze A, Glaze II=Glaze B, etc., all ceramic types replicate the source information. Ceramic Groups 1-10 refer to a sequence developed by Peckham and Wells (1967) and modified by Snow (1972a) when the Museum of New Mexico assembled information in the Cochiti area for the Cochiti Dam Salzage Project. Below is a summary of their ceramic groups:

Ceramic Group	Principal Pottery Types	Time Range
1	Lino Gray, San Marcial B/W	A.D. 750-850
2	Gray neckbanded, Piedra B/W	850-950

3	Gray neckbanded, Red Mesa B/W	950-1025
4	Gray corrugated, Kwahe'e B/W	1025-1175
5	Gray corrugated, Santa Fe B/W	1175-1275
6	Gray corrugated, Wiyo B/W	1275-1325
7	Gray corrugated, Biscuit A, Rio Grande Glaze A, B	1325-1425
8	Gray corrugated, Biscuit B, Rio Grande Glaze C,D, E	1425-1650
9	Plain red or micaceous utility, Tewa Polychrome	1650-1750
10	Plain red or micaceous utility, Puname Polychrome, modern Pueblo	1750-present

When a source stated that no ceramics were present, "no ceramics" was coded. If no information existed concerning the ceramics on a site, the category was deleted.

Other

Any additional categories of materials found on the sites were listed here. Examples are wood, bone, metal, etc.

Sources of Information

The sources of the information used in compiling the data presented on the printout are listed by author and date for manuscripts. Other information based on survey forms, files or laboratory analyses are listed by the institution gathering the information or the institution housing the records. The full references for the manuscripts are listed in the reference section of this report.

Comments

Additional miscellaneous information about the site is recorded here.

APPENDIX B

Inventory of Cultural Resources in the Permanent Pool of Cochiti Reservoir

Information recorded during the survey of the permanent pool has been abstracted from the various survey forms and is presented in the following printout. It has been summarized at both the general site and provenience levels. Data on the material culture(ceramic, lithic and historic) is described for each provenience, when applicable, to help isolate intrasite variability. For each site the following categories of information are presented:

<u>General Site Summary</u>

Site Number
Previous Documentation of Site
Site Size
Number of Proveniences
U.T.M. Coordinates
Drainage Basin
Physiographic Setting
Ecological Zone
Vegetative Structure
Cultural Period
Phase
Site Description
Artifactual Debris
Graphics

<u>Provenience Summary</u>

Provenience Number
Cultural Period
Phase
Provenience Description
Material Culture
- Ceramics
- Lithics
- Historic Artifacts

Many of these categories are self-explanatory. For those that are not, a brief discussion follows.

1. General Site Summary

Site Number

Each site was given a Laboratory of Anthropology (LA) number.

Previous Documentation of Site

If a site had been previously recorded prior to the survey of the permanent pool, the character of that data (survey or excavation) and the name of the investigator, institution and year of research was coded, e.g. Survey: Moore (SIU) 1969.

Site Size

Site dimensions were recorded in meters.

Number of Proveniences

A provenience is a locality within a site which represents various uses or activities at the site. For instance, butchering areas, middens, hearths or petroglyphs could be considered proveniences within a site. Since more than one provenience could be recorded for a single site, the exact number for the site is listed.

Elevation

Elevation was recorded in meters and feet.

U.T.M. Coordinates

Specific site locations are listed by Universal Transverse Mercator (U.T.M.) coordinates. The coordinate for the central-most point of the site was coded.

Drainage Basin

The name of the drainage basin in which the site is located is listed.

Physiographic Setting

The physiographic setting was divided into two major categories: 1) exposure, which locates the setting according to the eight cardinal points of a compass and 2) categories of situation which describes the

immediate physical surroundings of the site. Nine categories of situation were monitored: base of talus, sand dune, terrace (flats), bench above alluvial flats, interface of talus and bench, river bottom, alluvial bench, basalt talus and gravel. Combinations of categories were also used.

Ecological Zone

The ecological zones are those interpolated from aerial photographs. See the discussion presented in the introduction to Appendix A.

Vegetative Structure

The general vegetative structure of the area around each site was classified into one of seven categories: dense woodland (thick stands of trees with few open spaces), open woodland (forest), shrub land (low growth of shrubs, few trees, fairly open spaces), woodland mosaic (dense stands of trees with open spaces), barren with few trees (usually grasses and a few shrubs), savannah (grassland), and no information (no information was recorded during the survey).

Cultural Period

Nine categories of temporal and/or cultural affiliation were monitored. If there was doubt as to site affiliation a "?" was placed after the Period, e.g. Anasazi?. The temporal span ranges from Archaic to Modern. When a site could not be assigned a particular period on the basis of the cultural debris or structural components, an "unknown" was entered.

Phase

Phase refers to a cultural or temporal sequence within a Period. One cultural period may have several phases, e.g. Anasazi: PI, PII, PIII, etc.

Site Description

The format for site description was designed to summarize an entire site as a single unit. This description included the number of roomblocks,

rooms, depressions, hearths and the kind of rooms (masonry, circular etc.).

Artifactual Debris

The presence of different categories of material culture was noted here. More detailed descriptions of these materials is given for each provenience.

Graphics

The presence and kind of graphics (petroglyphs, pictographs and pecked stone) are listed under this category.

2. Provenience Description (for each provenience at a site)

Provenience Number

The number of the provenience to be discussed is listed.

Cultural Period

The temporal and/or cultural affiliation for the provenience is listed The categories are the same as those listed for the general site description. Note that the cultural period for a provenience may differ from that of other proveniences and the site as a whole.

Phase

The phase of the provenience is listed.

Provenience Description

The format for the provenience description included:

1. Structures: Structures that could be assigned a functional name such as corral, roomblock etc. were recorded here.

2. Rooms: The exact number of rooms was entered. If the actual number of rooms could not be determined and the count was estimated, the highest number was entered. If the structure contained more than one room, the average room size was coded. All measurements were made in meters. The types of constructuion materials (adobe, basalt etc.), how they were shaped

and placed, the method of construction, number of courses, wall height and the orientation of the structure from true north was coded.

3. Hearths: The number of hearths, a description of the hearths and their location (within a room or open--not found in a structure) was coded.

4. Other Types of Features: Mealing bins and other features were recorded here.

5. Other (Type of Site): This category included nonstructural sites and included lithic and ceramic scatters, petroglyphs etc.

Material Culture

For each provenience at a site the following categories of material culture (ceramics, lithics and historic artifacts) were summarized:

1. Ceramics: For each ceramic summary the following information was was coded: size of sampled area, cultural period and phase, the frequency and type of ceramics encountered and the number of sherds which were ollas or bowls.

2. Lithics: For each lithic summary the following information was coded: size of sampling unit, total debitage frequency, the percentage of utilized debitage, and a chart with the frequency of lithic categories (cores, manso etc.) by material type (obsidian, basalt, chert, etc.).

3. Historic Artifacts: The following information about historic materials (glass, metal, wood, etc.) was coded: size of sampling unit and a table with the artifact type, frequency and projected date.

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